REVIEWING THE U.S.–CHINA CIVIL NUCLEAR COOPERATION AGREEMENT

JOINT HEARING

BEFORE THE

SUBCOMMITTEE ON ASIA AND THE PACIFIC

AND THE

SUBCOMMITTEE ON TERRORISM, NONPROLIFERATION, AND TRADE

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REVIEWING THE U.S.–CHINA CIVIL NUCLEAR COOPERATION AGREEMENT

THURSDAY, JULY 16, 2015

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ASIA AND THE PACIFIC AND
SUBCOMMITTEE ON TERRORISM, NONPROLIFERATION, AND TRADE,
COMMITTEE ON FOREIGN AFFAIRS,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:03 a.m., in room 2172, Rayburn House Office Building, Hon. Matt Salmon (chairman of the subcommittee) presiding.

Mr. SALMON. The subcommittee will come to order. Let me start by recognizing myself and the ranking member to present our opening statements. And without objection, the members of the subcommittee can present brief remarks if they choose to or they can submit them for the record.

We convened this hearing today to discuss the merits of the U.S.-China Civil Nuclear Cooperation Agreement, which was submitted to Congress in late April, this 30-year agreement, which is required by section 123 of the Atomic Energy Act of 1954 and is a prerequisite for any significant nuclear cooperation with any country, any other country other than the United States.

The movement of nuclear material and technology across borders deserve close examination. Today, we expect to hear from our distinguished witnesses on their assessment of the viability of our civil nuclear cooperation with China, as well as what their concerns may be about nuclear proliferation and the transfer of technology and knowledge for military purposes. We also expect to hear about the potential benefits of the 123 Agreement, including expanded engagement with China, building mutual confidence, increasing clean energy sources, and supporting U.S. businesses.

China's nuclear power program is the most rapidly expanding in the world, so the U.S.-China 123 Agreement could provide a unique opportunity for U.S. businesses. The Department of Energy approved a bid by Westinghouse to build four nuclear reactors in China and six more are planned. But as many as 30 more are proposed. Currently, China has an additional 23 reactors under construction and plans to build up to 100 more by 2030.

The PRC announced in December 2014 that it would spend about $11.2 billion annually on reactor construction during the next 10 years. However, I am concerned about the U.S. transferring its technology to China because Chinese firms may eventually re-ex-

port reactor technology to other countries without proper U.S. checks.

Approximately 30 percent of the work outlined under current contracts is being performed in the United States by Westinghouse or its subcontractors and suppliers, which has created or is sustaining approximately 8,000 direct jobs and another approximately 20,000 indirect jobs in the United States, in 20 United States. But technology transfer provisions in the contract would reduce U.S. participation in Chinese nuclear projects over time. I would be interested to hear from out witnesses how we would secure jobs for American workers with these limitations in the provisions in the agreement.

The agreement also raises important security questions. The Defense Intelligence Agency warned in February 2015 that China will continue to be a source of dual-use, WMD-applicable goods, equipment, and materials to countries of concern like Iran, North Korea, and Syria.

Furthermore, the Nonproliferation Assessment Statement submitted with the administration's proposed agreement states that despite updates to regulations and improved actions in some areas, proliferation involving Chinese entities remains a significant concern. Without proper U.S. oversight of continued civil nuclear cooperation, I would be hesitant to condone an agreement that would pose major risks to our national security, and I would like hear from our administration witnesses as to how we can address those concerns.

The second concern involves military diversion. Experts have debated whether China has already diverted or intends to divert U.S. civilian nuclear technology for military purposes, including in naval reactors, which would violate the existing 123 Agreement. Chairman Royce voiced his concern as far back as 2007, and at a Senate Foreign Relations hearing in May of this year, it seemed to confirm that suspicion. I would like to hear what the administration intends to do to remedy potential violations and hear how the United States will safeguard our sensitive technology from Chinese military diversion in the future.

Lastly, I am concerned with China's plan to re-export nuclear power plants based on U.S. technology. Westinghouse's AP1000 technology is a crucial component to China's planned nuclear export program, though China only holds a license to use that technology domestically. What safety considerations exist during the re-export of U.S. reactor technology?

Aggressive Chinese exports of nuclear technology, particularly to countries that do not currently have nuclear power, could pose proliferation risks. In fact, the Nonproliferation Assessment Statement noted that China's ongoing construction of new nuclear power plants in Pakistan as inconsistent with its Nuclear Suppliers Group commitments.

Nearly 30 years ago, President Reagan said he was particularly proud of the agreement, saying it will open broad opportunities for joint work in development of the energy base which China needs for her modernization. At the time, the United States and China made mutual pledges of cooperation, nonproliferation, and safety.

We are here today to discuss whether China has met those obligations.

When President Obama submitted the new 123 Agreement, he said that the agreement will advance the nonproliferation national security interests of the United States. I would like to hear from the administration why Congress should feel confident that China will live up to nonproliferation commitments, that we will have measures in place to prevent military diversion of our technology, and how we could safeguard our economic, political, and military interests.

Members present are going to be permitted to submit written statements to be included in the official hearing record. And without objection, the hearing record will remain open for 5 calendar days to allow statements, questions, and extraneous materials for the record subject to the length limitation rules.

I now recognize Ranking Member—actually, I am going to recognize Mr. Keating, who is the ranking member here today, for any remarks he would like to make. And then I will recognize the other chairman.

Mr. KEATING. Thank you, Chairman Salmon, Ranking Member Sherman, and Chairman Poe. Ranking Member Sherman will be here during the course of the hearing.

In continuing the United States' longstanding commitment to preventing nuclear proliferation around the world, it is critical we provide the U.S.-China Civil Nuclear Cooperation Agreement with proper scrutiny.

Our relationship with China is multifaceted and complex. There is no denying that the U.S. has a much different posture toward China than we did when the last 123 Agreement was entered into in 1985. In many ways, the Chinese Government has improved its nonproliferation efforts since joining the Nuclear Nonproliferation Treaty and Nuclear Suppliers Group in 1992 and 2004, respectively.

However, there remains little doubt that the Chinese Government still has work to do when it comes to enforcing its own export control laws, preventing the sale of dual-use goods, and prosecuting individuals and companies involved in proliferation to countries like North Korea and Iran.

China's unfortunate track record of stealing trade secrets by means of cyber attacks and other methods is a further reason to be cautious about unduly trusting China when it comes to technological transfers.

While I am encouraged that the new China 123 Agreement includes stronger enforcement of nonproliferation controls, I remain concerned about whether China will meet its nonproliferation obligations. In particular, I am interested to determine whether under this new agreement China will be able to re-export nuclear reactors based on U.S. design technology without having to obtain permission from the U.S. Government. China's obligations under this agreement in the case of re-transfers to third countries need to be clearly defined and understood.

In addition, I question whether China could divert elements of U.S. reactor designs for use in their nuclear submarine reactors, a prospect that could challenge U.S. naval superiority.

These are among the concerns I look forward to hearing addressed at today's hearing with our witnesses. And I hope that the hearing will contribute to a productive and detailed dialogue regarding our current nuclear energy cooperation with China and the security risks we have at hand.

With that, I yield back.

Mr. SALMON. Thank you.

I now recognize Chairman Poe.

Mr. POE. Thank you, Chairman Salmon, for working with our subcommittee to put together this important hearing about the U.S.-China 123 Agreement. The current agreement was negotiated, as you said, by the Reagan administration 30 years ago. It has allowed us to cooperate with China on civilian nuclear energy and it is supposed to expire in December.

China is the world's largest market for nuclear technology. By 2032, China will become the world's largest generator of nuclear power. There are major U.S. economic interests at stake. Chinese contracts to American companies have created billions of dollars in U.S. exports and thousands of American jobs, and we have partnered with China in valuable joint ventures and development projects. For example, in July 2007, the contract awarded to Westinghouse will supply China with four AP1000 nuclear power plants at an estimated cost of $8 billion.

Proponents of the new agreement make the point that if this agreement is not renewed, the United States nuclear industry will face billions of dollars of lost revenue. They are also concerned that without these new Chinese contracts, the U.S. industry will struggle to keep up with its expertise.

Our engagement with China under the current 123 Agreement has advanced China's nuclear nonproliferation policies and practices. American equipment and technology exports have allowed China to use the safest technology in the industry. The new agreement required China to notify us before approving technology transfers and limits these transfers to countries committed to using them for peaceful purposes only.

Our nuclear engagement with China has been crucial in reducing China's carbon emissions as well. Proponents of renewing the 123 Agreement argue that ending our cooperation will disrupt China's nuclear development plans and have a negative environmental effect.

Despite that, there are several concerns regarding the renewal of our nuclear cooperation with China. China has yet to show it has the political will to prevent Chinese-based companies from exporting nuclear technology and equipment to countries such as Iran, North Korea, and Syria. Even this week, we have heard of a Karl Lee, the so-called A.Q. Khan, helped Iran get nuclear technology from China, namely, high missile technology that is illegal. The Chinese Government response to this action was they never heard of him or go fishing.

The Congressional Research Service's last unclassified review of China's proliferation record in January spotlighted China's proliferation activities related to Pakistan, North Korea, and Iran. The current 123 Agreement does not require China to place civilian nuclear facilities under IAEA safeguards. Another point missing from

the current agreement is nuclear consent right provisions. That means that China is not required to seek U.S. consent to manufacturer or re-export U.S.-designed reactors or U.S. nuclear components.

And we also don't know what extent China is diverting technology from its civilian nuclear energy program to its nuclear weapons and military programs. Experts have noted that Chinese civil and nuclear entities are alarmingly close and may already be cooperating. The President's Nonproliferation Assessment Statement explicitly points out China's longstanding tradition of using civil technology for its military programs.

So this hearing today will help us better understand the advantages for renewing this 123 Agreement, what is in the best national security interest of the United States. And I thank the chairman. I will yield back.

Mr. SALMON. Thank you.

The Chair recognizes Mr. Connolly.

Mr. CONNOLLY. Thank you, Mr. Chairman.

I think when we look at the proposed pending agreement, it is a balancing act for the United States. I think our national security and global nonproliferation goals need to be preeminent, but we can't be ignorant of the business implications and the competition for the Chinese market that is hot.

Congressional objections to a 123 Agreement with China are not new. The current agreement, as has been noted, began during the Reagan administration, submitted in 1985 to Congress. Congress then saw fit to place conditions on the implementation of the agreement in the joint resolution relating to the approval and implementation of the proposed agreement fornuclear cooperation between the U.S. and the PRC and the Foreign Relations Authorization Act for Fiscal Years 1990 and 1991.

The Presidential certifications contained in these pieces of legislation represented the far-reaching concerns Congress had then and in many cases still continues to have about China. Before the agreement was implemented, a full 13 years after being submitted to Congress, the President had to make certifications with respect to China's assurance that it was not transferring nuclear weapons technology to non-nuclear states. Chinese nonproliferation policies and political reforms were being made by the PRC Government.

The nonproliferation landscape in China has changed since then. China acceded to the Treaty on Non-Proliferation of Nuclear Weapons in 1992 as a nuclear weapon state, and since has become a member of the Nuclear Suppliers Group. China implemented a safeguards agreement with the IAEA in 1989 and agreed to the additional protocol in 2002.

It should be noted that integrating China into the international nonproliferation regime does add a level of transparency previously lacking. Considering the growth of the nuclear technology industry in China, this integration and its accompanying benefits could be seen as welcome developments. Today, China has 26 operational nuclear reactors, with 23 under construction, and a plan to build another 100 by the year 2030. As a matter of comparison, the United States has 99.

China and Chinese entities, however, have a nuclear track record that cannot be wiped under the carpet. The U.S. Government has certified that China provided assistance to the nuclear weapons program in Pakistan. China transferred gaseous uranium hexafluoride to Iran for centrifuge enrichment research. And the U.S. continues to sanction state-owned enterprises and small and medium enterprises in China that have been sources of illicit dual-use technology for foreign buyers.

There is a demonstrated wanton disregard for export restrictions in China, and the PRC seemingly refuses to take enforcement action against those violators. At the Senate Foreign Relations Committee hearing in May, the Assistant Secretary for the Bureau of International Security and Nonproliferation stated that China has neither the bureaucratic capability nor the political will adequately to control dual-use exports. That is especially concerning provided that North Korea and Iran have documented operations to procure sensitive nuclear technologies in China.

During our review period, we are going to have to consider these among lots of other issues. And Congress takes seriously its commitment to nonproliferation, as we know the administration does as well.

So I look forward, Mr. Chairman, to hearing the testimony today and hearing how we address some of these thorny issues that, as I said, cannot be ignored during this review record.

I yield back.

Mr. SALMON. Thank you.

Mr. Wilson.

Mr. WILSON. Thank you, Mr. Chairman.

With over 20 nuclear reactors currently in operation and 28 more under construction, China is one of the largest and fastest growing nuclear energy markets in the world. Private companies in other countries, such as the Russian Federation and France, can openly compete for construction operations contracts for Chinese reactors and share best practices to avoid delays, reduce costs, and expedite construction.

In South Carolina, SCANA and Santee Cooper each are successfully operating a Westinghouse AP1000 nuclear reactor built by Chicago Bridge & Iron identical to the reactors currently being built in China now. I regularly hear from their employees about the benefits of sharing lessons learned and best practices.

We should reauthorize the agreement to ensure that American companies have the same opportunity to compete for Chinese nuclear contracts and to share resources. I am grateful to sponsor House Joint Resolution 56, which provides for the approval of the new U.S.-China Nuclear Cooperation Agreement.

I would like to thank Chairman Matt Salmon and Chairman Ted Poe for putting together this hearing with very credible panelists and look forward to the continuation of the U.S.-China civilian nuclear cooperation, which is personal me to me, as my father served in China in 1944 and 1945, where he developed an appreciation of the people of China as a member of the U.S. Army Air Corps defending the people of China.

I yield back my time.

Mr. SALMON. Thank you.

Do any other members seek recognition?

We have two panelists today. And I believe we are going to get a wealth of knowledge regarding this issue. And I appreciate the expertise of the folks that are here today.

First of all, I would like to introduce Assistant Secretary Thomas Countryman, who heads the Bureau of International Security and Nonproliferation at the Department of State, and Lieutenant General Frank Klotz, Under Secretary for Nuclear Security and Administrator of the National Nuclear Security Administration and Department of Energy.

Mr. Countryman.

STATEMENT OF THE HONORABLE THOMAS M. COUNTRYMAN, ASSISTANT SECRETARY, BUREAU OF INTERNATIONAL SECURITY AND NONPROLIFERATION, U.S. DEPARTMENT OF STATE

Mr. COUNTRYMAN. I would like to thank the two chairmen, Mr. Salmon and Judge Poe, and the ranking members and all the members for this opportunity. The agreement you have before you replaces the agreement originally negotiated in the Reagan administration in 1985, and it is an improvement over that agreement in all respects.

This agreement is not a commercial contract. It does not provide for the sale of nuclear equipment or technology to China. Rather, it provides a framework under which the United States can make the decisions on particular requests for export of nuclear technology to China.

It is not a giveaway. It rather is a mutual recognition that the U.S. and China have reciprocal obligations to each other that each must meet. And it recognizes also that the world is different from 1985 and that China is now among the world leaders in nuclear technology.

It is not a lever. It is not something that is simply given away to China with which we can extract concessions from China in unrelated fields.

This agreement meets all the requirements of the Atomic Energy Act. It also reflects the consistent position of this administration that a negotiation of 123 Agreements, our highest priority are nonproliferation standards.

The agreement has important benefits, as noted already, in the field of economic interests of the United States, including jobs. It also, of course, is an essential element in helping to manage the complex bilateral relationship that we have with the People's Republic of China.

But my responsibility in leading negotiations and the responsibility that both Congress and the administration have given is to ensure that nonproliferation concerns are uppermost, and I believe we have fully met that standard.

This is not to say that we are satisfied with the performance of China on a number of issues, particularly on export control issues. As was noted, I testified to the Senate 2 months ago that China has not shown the necessary capability and will to fully enforce export control requirements, its own legislation, and its obligations under U.N. Security Council resolutions.

And I welcome higher-level political attention being given to those issues. It is necessary that the Chinese Government hear that this is an issue of significant political and security concern.

At the same time, it is important to recognize, as Congressman Connolly has, that the performance of China in nonproliferation standards is far different from what it was 30 years ago. It continues to improve. We are in no way satisfied with the degree of improvement, and we will continue to press for China to meet its obligations more fully.

But it would be incorrect to think that Chinese performance would improve if this agreement is not implemented. I am convinced exactly the opposite would happen.

On the military issues and technology transfer issues that have been raised, I refer back to a closed briefing that we provided last month, to the briefing provided at that point by the experts in nuclear propulsion technology, and the reasons that we gave at that point for the President's conclusion that this agreement does not pose an unacceptable risk to America's national security. We are, of course, happy in closed session to repeat all of those briefings individually or for the committee as a whole.

With those comments that I hope are responsive to the initial concerns you have raised, I recommend to you this agreement. Thank you.

[The prepared statement of Mr. Countryman follows:]

Testimony of Assistant Secretary Thomas M. Countryman on the President's Submission to the Congress of the U.S.-China Agreement for Peaceful Nuclear Cooperation (123 Agreement)

Joint Subcommittee Hearing: U.S. - China Civilian Nuclear Agreement

Subcommittee on Asia and the Pacific, Subcommittee on Terrorism, Nonproliferation, and Trade

July 16, 2015

Chairman Salmon, Chairman Poe, Ranking Members Sherman and Keating, and Members of the Subcommittees:

Good afternoon. It is a pleasure to testify before the Committee today regarding the President's submission of an agreement for peaceful nuclear cooperation between the United States and China.

As you know, the U.S. relationship with China is one of the most important and complex relationships we have in the world. Over the last six years, the Obama Administration has established a "new normal" of U.S. engagement with the Asia-Pacific that includes relations with China defined by building high quality cooperation on a range of bilateral, regional, and global issues while constructively managing our differences and areas of competition. Through the implementation of this policy, the United States

and China continue to improve diplomatic coordination to address the regional and global challenges of nuclear nonproliferation, energy security, and climate change, while growing both our economies. Peaceful nuclear cooperation with China is an example of collaboration that touches on all these challenges, and I'd like to explain why the Administration believes it is in the best interests of the United States to continue this important area of cooperation.

Description of Agreement

Like all 123 agreements, this agreement is first and foremost an asset that advances U.S. nonproliferation policy objectives. It took approximately two and a half years to negotiate the agreement, and after numerous interventions by senior U.S. government officials throughout this period, our negotiators were able to win inclusion of significant new nonproliferation conditions that strengthen the agreement. The President's transmittal of the agreement, and the Nonproliferation Assessment Statement that accompanied it, include a detailed description of the contents of the agreement so I will not repeat that here, but the agreement contains all the U.S. nonproliferation guaranties required by the Atomic Energy Act and common to 123 agreements, including conditions related to International Atomic Energy Agency (IAEA) safeguards, peaceful uses assurances,

physical protection assurances, and U.S. consent rights on storage, retransfer, enrichment, and reprocessing of U.S.-obligated nuclear material. The agreement clearly states that equipment, information, and technology transferred under the agreement shall not be used for any military purpose, and the new text includes a right for the United States to suspend cooperation in the event of Chinese non-compliance, as well as our long-standing right to cease cooperation altogether. It also has a fixed duration of thirty (30) years. It is worth noting that the agreement does not commit the United States to any specific exports or other cooperative activities, but rather establishes a framework of nonproliferation conditions and controls to govern any subsequent commercial transactions.

Differences Between the 1985 and 2015 Agreements

The 2015 agreement enhances several U.S. nonproliferation controls beyond those contained in the current U.S.-China 123 agreement, which was signed in 1985. Unlike the 1985 agreement, the 2015 agreement requires China to make all U.S.-supplied nuclear material and all nuclear material used in or produced through U.S.-supplied equipment, components, and technology subject to the terms of China's safeguards agreement with the IAEA. The 2015 agreement also contains additional, elevated controls on unclassified civilian nuclear technology to be transferred to China. Further,

the agreement requires the two Parties to enhance their efforts to familiarize commercial entities with the requirements of the agreement, relevant national export controls, and other policies applicable to imports and exports subject to the agreement – a requirement that will be implemented through joint training by U.S. and Chinese officials of commercial entities in both countries.

The background underlying the agreement has also changed. China's nonproliferation record has improved markedly since the first U.S.-China 123 agreement was signed in 1985, though it can still do better. Over the past thirty years, China has undertaken a variety of efforts to enhance its global standing on nonproliferation issues while significantly expanding its civil nuclear sector. Since the 1980s, China has become a party to several nonproliferation treaties and conventions and worked to bring its domestic export control authorities in line with international standards. China joined the Nuclear Nonproliferation Treaty in 1992, brought into force an additional protocol with the International Atomic Energy Agency in 2002, and joined the Nuclear Suppliers Group in 2004.

Justification for Agreement

In addition to the improved nonproliferation conditions that I have already described, the agreement will have benefits for the U.S.-China

bilateral relationship, for nuclear safety in the United States and worldwide, for our economy, and for the climate. I'd like to touch on each of these for a moment.

Bringing a new 123 agreement with China into force will improve not only our bilateral nonproliferation relationship but also our overall bilateral relationship, and reflects the U.S. government effort to better rebalance our foreign policy priorities in Asia. We strongly believe that implementing this agreement will better position the United States to influence the Chinese Government to act in a manner that advances our global nuclear nonproliferation objectives. Conversely, failing to do so would set us back immeasurably in terms of access and influence on issues of nonproliferation and nuclear cooperation. The current China 123 agreement has allowed for, and the agreement will continue to facilitate, deepened cooperation with China on nonproliferation, threat reduction, export control, and border security. We believe that continuing cooperation with China will allow us to push China further to adhere to international norms in this area and meet U.S. standards of nonproliferation, nuclear safety and security.

Nuclear Safety

With respect to nuclear safety, as U.S. and Chinese experts work together in the development of Westinghouse's AP1000 reactors in China, their collaboration enhances the strength of the safety culture in the Chinese civil nuclear program. Even the choice of AP1000 technology, with passive safety systems, over other, older, less safe technologies, enhances nuclear safety in China. It is fundamentally in the U.S. interest to promote the spread of U.S. best practices in nuclear safety as a nuclear accident anywhere is a global problem. The United States will have a far greater influence on Chinese nuclear safety practices if cooperation is continued than if it is cut off. When we export U.S. civil nuclear technology, we also export an American nonproliferation, safety, and security culture that encourages a safe and responsible Chinese civil nuclear program.

Economic Benefits

There are also very significant economic reasons to remain engaged with China in nuclear cooperation. China has the fastest growing nuclear energy program in the world, with twenty-seven (27) nuclear power plants in operation, twenty-four (24) under construction, and dozens more planned. Over one-third of the world's nuclear power plants currently under construction are in China. Westinghouse estimates the value of China's

second wave of six reactors at $25 billion with the potential for $2.5 billion in U.S. export content. In addition, U.S. civil nuclear companies are supplying China – and if this agreement is brought into force, could continue to supply China – with equipment and components as well as a broad range of services, including engineering, construction, fuel cycle expertise, and training. The proposed agreement would allow for future joint U.S.-Chinese supply partnerships if China were to become a larger nuclear supplier in the future. These export opportunities could support tens of thousands of high-paying American jobs. For all of these reasons, the U.S. nuclear industry strongly supports the agreement. Indeed, the Department of Commerce's Civil Nuclear Trade Advisory Committee identified the renewal of the U.S.-China 123 agreement as one of its top priorities and a top priority for the U.S. civil nuclear industry.

Climate Change

The agreement can also help both of our countries to deploy non-fossil based energy sources to address the effects of global climate change. In November 2014, President Obama and Chinese President Xi took a historic step for climate change action and for the U.S.-China relationship by jointly announcing the two countries' respective post-2020 climate targets.

The announcement was the culmination of a major effort between the two countries, inspired by our serious shared concern about the global effects of climate change and our commitment to leadership as the world's largest economies, energy consumers, and carbon emitters. One of China's announced targets is to increase the share of non-fossil energy to around 20% by 2030 – an approximate doubling from current levels. China sees the large scale development of civil nuclear power as key to meeting this and other climate targets, and these commitments strongly reinforce opportunities for U.S. nuclear suppliers in the Chinese market.

Negative Consequences of Lapse

I'd also like to take a moment to highlight some of the negative consequences should the United States cease nuclear cooperation with China. A failure, or delay, to put in place a new agreement to replace the current expiring agreement would undermine U.S. nonproliferation policy and our nuclear industry and would have a significant effect on the broader U.S.-China bilateral relationship.

As I described earlier, the current 123 agreement has been a vehicle for significant U.S. influence on China's nonproliferation policy. If

cooperation ceases, U.S. influence on Chinese nonproliferation practices will be placed in serious jeopardy. A lapse in the agreement would most likely lead to a suspension of our nonproliferation dialogues, to include recently established mechanisms seeking to enhance China's export control enforcement capabilities, thereby damaging our cooperation in countering shared proliferation challenges. In addition, if the United States does not maintain its nuclear cooperation with China, that vacuum will be filled by other nuclear suppliers who do not share the same nonproliferation and safety-focused practices in the execution of their civil nuclear cooperation.

Ending U.S.-China cooperation would also be devastating for our nuclear industry. All significant nuclear commerce between the United States and China would stop, and a large number of high-paying American jobs would likely be lost. More broadly, unilateral termination of this relationship would discredit the United States as a reliable supplier, undermining the ability of the U.S. civil nuclear industry to compete globally and enabling competitors such as Russia and France to gain a greater foothold in China's nuclear energy market, as well as in other markets. The construction of four Westinghouse AP1000 reactors in China is driving innovation in the U.S. civil nuclear industry, helping us

domestically to make the AP1000 reactors currently under construction in the United States safer and more efficient. Without this continuous learning process, the United States will lose global market share. If there is no successor agreement, U.S. civil nuclear companies with joint ventures in China will also lose the technology and hardware they have already provided to China – there is no U.S. government right of return at the expiration of the agreement– and the United States will not benefit from future sales arising from these ventures.

Finally, it is worth emphasizing that China would view a lapse of this agreement as evidence that the United States is less willing to engage China at a high level on important commercial, energy, environmental, and security related issues. Stopping U.S.-China cooperation would also strengthen the position of those in China who advocate a more confrontational approach to the bilateral relationship and create new difficulties in our efforts to manage this complex relationship.

Conclusion

In sum, we believe that the strategic, nonproliferation, economic, and environmental benefits of this agreement demonstrate that the continuing

nuclear cooperation with China is in the best interests of the United States. We are mindful of the challenges that this relationship and this agreement present, and yet we firmly believe the clear path forward is to remain engaged with China, constructively manage our differences, and work collaboratively to advance our numerous common objectives while bringing China toward international norms of behavior. This is not just a matter of U.S. engagement with China, it is frankly a test of U.S. leadership and our ability to continue to play a decisive and prominent role in crucial sectors such as the civilian nuclear power industry. The entry into force of this agreement will allow the United States to continue to develop and participate in the world's largest nuclear power market, which is the best way to ensure that fundamental U.S. national interests in this area are advanced in the long term.

Mr. Chairman and Ranking Member, thank you.

Mr. SALMON. Thank you.
General.

STATEMENT OF LIEUTENANT GENERAL FRANK G. KLOTZ, USAF, RETIRED, UNDER SECRETARY FOR NUCLEAR SECURITY, ADMINISTRATOR, NATIONAL NUCLEAR SECURITY ADMINISTRATION, U.S. DEPARTMENT OF ENERGY

General KLOTZ. Thank you, sir.

Chairman Salmon, Chairman Poe, Ranking Member Keating, and distinguished members of the subcommittee, thanks for the opportunity to testify on behalf of——

Mr. CONNOLLY. Mr. Chairman, could I ask the General to put—thank you—move it closer to your mouth. Thank you.

General KLOTZ. I am pleased to join my colleague from the State Department, Assistant Secretary Tom Countryman. I am pleased also to represent the Department of Energy in discussing this proposed U.S.-China Agreement for Peaceful Nuclear Cooperation. I have provided a written statement for the record, and I respectfully request that it be submitted for the record.

Secretary of Energy Moniz and I share the view that the proposed agreement provides a comprehensive framework for nuclear cooperation with China, while fully protecting and advancing U.S. interests and policy objectives with respect to nuclear nonproliferation and the peaceful uses of nuclear energy. Thus, the Department of Energy fully supports entry into force of this agreement following the requisite congressional review period.

The agreement is fully consistent with law and incorporates all terms required by section 123 of the Atomic Energy Act. Moreover, it reflects important advances over the current agreement, several of which were discussed during the classified briefing to members of this committee that Assistant Secretary Countryman just alluded to.

Specifically, the successor agreement enhances the provisions that allow China to enrich and repross U.S.-obligated nuclear material by requiring that such enrichment and reprocessing take place only at facilities in China that fall under the International Atomic Energy Agency's safeguards agreement. It also provides for enhanced controls on the expert of nuclear technology to China, and it commits both sides to deliver export control training to all U.S. and Chinese entities under the 123 Agreement.

Taken together, these elements, not included in the 1985 agreement, provide an unprecedented level of insight into commercial transactions.

Since the preceding 123 Agreement was signed 30 years ago, we have witnessed China make significant strides in its civil nuclear program. The Department of Commerce, in fact, has identified China as one of the largest and most important markets for the U.S. nuclear industry, with over 20 nuclear power plants in operation, over 20 under construction, and dozens more planned. And China will continue to invest heavily in its nuclear industry to meet its own expanding energy needs and to meet growing global interests in and demand for nuclear power as a source of clean energy.

The rapid growth of China's civil nuclear energy program could have significant benefits for U.S. industry, as well as our scientific and technical base. American civil nuclear companies already have numerous joint ventures with China, as well as significant assets on the ground in China. They are supplying China with equipment and components, as well as a broad range of services, including engineering, construction, and training.

The successor 123 Agreement will facilitate continued nuclear cooperation with China, subject, as always, to U.S. Government review of specific requests to transfer nuclear technology, information, material, equipment, and components.

On the other hand, if the agreement lapses or is not renewed, U.S. industry will not be able to continue with the current ventures and could lose significant investments it has already made in China's civil nuclear program. U.S. industry would also be precluded from taking advantage of opportunities in the world's fastest growing civil nuclear energy market.

In addition to these economic benefits, the successor 123 Agreement will also serve as an umbrella for other forms of U.S.-China bilateral cooperation in promoting important U.S. policy objectives with respect to enhancing nuclear safety and security around the world, an objective which directly supports our U.S. national interest, as well as those of our allies and partners.

U.S.-China cooperation in the civil nuclear realm, such as under the 1998 U.S.-China Peaceful Uses of Nuclear Technology, or PUNT, Agreement, has been absolutely invaluable in this regard. Just recently, senior U.S. officials met with their Chinese counterparts in Chengdu under the auspices of the PUNT Joint Coordinating Committee. They discussed nuclear technology, security, and safeguards, environmental and waste management, emergency response operations, the security of radiological sources, and so on. U.S. participants have reported to me that they had unique and unprecedented access to a number of construction, scientific, and academic sites.

This level of interaction and access is only possible because of the value that China places in having a 123 Agreement with the United States and its desire to cooperate with us. Without entry into force of the successor agreement, we will lose a critical mechanism for influencing China's nonproliferation behavior, we will lose economic and commercial benefits, and we will lose the insight we have into China's nuclear programs.

Again, thank you for the opportunity to appear before you today, Chairman. And I look forward to any questions that you all may have.

[The prepared statement of General Klotz follows:]

Statement of Lt. Gen. Frank G. Klotz, USAF (Ret.)
Under Secretary for Nuclear Security
U.S. Department of Energy
on the
United States-China Agreement for Peaceful Nuclear Cooperation
Before the House Committee on Foreign Affairs

Subcommittee on Asian and the Pacific &

Subcommittee on Terrorism, Nonproliferation, and Trade

July 16, 2015

Chairman Salmon, Chairman Poe, Ranking Member Sherman, and Ranking Member Keating, and Members of the Subcommittees, I appreciate the opportunity to submit this testimony in support of the successor U.S.-China Agreement for Peaceful Nuclear Cooperation, or the so-called "123 Agreement." The successor 123 Agreement provides a comprehensive framework for peaceful nuclear cooperation with China based on a mutual commitment to nuclear nonproliferation. The Department of Energy (DOE), as a member of the interagency negotiating team, strongly supports entry into force of this Agreement following the requisite Congressional review period. This Agreement is fully consistent with the law and incorporates all of the terms required by Section 123 of the Atomic Energy Act of 1954 (AEA). This Agreement will replace an existing 123 Agreement with China that has been in place since 1985.

Status of the Agreement

The Agreement was submitted by President Obama for congressional review on April 21, 2015, along with the required unclassified Nuclear Proliferation Assessment Statement (NPAS) and two accompanying classified annexes. The Secretary of State and the Secretary of Energy recommended that the President make the legal determination that the Agreement "will promote, and will not constitute an unreasonable risk to, the common defense and security." The Secretary of Energy and I share that view based upon a number of factors detailed in this testimony. Our complex relationship with China presents both challenges and opportunities. One of the most dynamic areas of collaboration we have is in the energy sector, which is why continuing U.S.-China civil nuclear cooperation remains in the best interest of the United States.

Justification for the Agreement

Let me briefly highlight some important elements and why this agreement is essential for upholding our shared nonproliferation, energy, and commercial goals.

The successor 123 Agreement is an important element in promoting strong nonproliferation policies and our interest in seeing China further advance its already improved record on proliferation issues. The successor Agreement not only complies with all of the nonproliferation

measures and controls required by U.S. law, but it also includes new elements that provide for further assurances that this cooperation is solely peaceful in nature and will not be re-directed for other purposes. In particular, the Agreement includes, among other requirements, that adequate physical protection measures be maintained with respect to U.S.-obligated nuclear material and equipment; the U.S. right to prior consent to any retransfer from China of U.S.-obligated nuclear material, equipment, or components; and the requirement that no U.S.-obligated nuclear material may be enriched or reprocessed without the prior approval of the United States.

Many on the Subcommittee may be interested to know how we can proceed with nuclear cooperation with China in a way that protects our vital national security interests. In the view of the Department of Energy, the conclusion of a 123 Agreement with China will enhance our ability to manage and mitigate the risk of China diverting sensitive nuclear technology to its military programs or re-exporting it without U.S. permission. Indeed, it is my view that we are better off from a national security perspective by completing this Agreement than we are without any 123 Agreement in place at all.

Technology Transfer Provisions in the Successor Agreement

Broadly speaking, the challenges that arise regarding nuclear cooperation with China are not unique to China. In working with any foreign partner, the United States places emphasis on measures to ensure that nuclear technology transferred from U.S. companies is not used or retransferred in a manner that is prohibited by the terms of the Nuclear Non-Proliferation Treaty (NPT), other treaties, or U.S. statutory law, or is inconsistent with U.S. commitments to the Nuclear Suppliers Group (NSG), and all other U.S. nonproliferation commitments and policies.

To address the opportunities and challenges presented in ongoing civil nuclear cooperation with China, the United States negotiated new and unique provisions in the successor 123 Agreement.

First, we elevated the level of authorization required for the provision or transfer of civil nuclear technology to China. Under the successor Agreement, technology transfers will now be authorized under the provisions of the 123 agreement itself. The terms of the successor 123 Agreement establish a mechanism for the United States to greatly increase our oversight of proposed technology transfers from the United States to China. In effect, all of the nonproliferation assurances and other provisions in the 123 Agreement would now apply to technology covered by subsequent arrangements that the Secretary may issue pursuant to Section 131 of the AEA. This is a far more robust process than the government-to-government nonproliferation assurances that are provided by the Government of China for technology transfers authorized by the Secretary of Energy pursuant to 10 CFR Part 810 (Part 810).

Furthermore, under the successor Agreement, the United States and China would now review on an annual basis requests from U.S. industry to identify projects and end-users that are eligible for receipt of nuclear technology subject to the 123 Agreement, upon entry into Section 131 subsequent arrangements. This is a new element that was not included in the 1985 Agreement and would provide an unprecedented level of insight into commercial transactions.

As compared to the current regulatory pathway, this method would provide for greater oversight of all the covered activities, and would allow for more timely decisions regarding technology

transfer requests so that U.S. companies may be increasingly competitive in the Chinese market. It would also make the failure to comply with the technology transfer authorizations issued under the 123 Agreement a breach of the legally binding terms of the Agreement.

Joint Training Requirements in the Successor Agreement

The new terms regarding technology control also mean that both the United States and China will need to educate our respective industries on the new process, its goals, how it would work, and most importantly, the terms and limitations of the successor 123 Agreement. We are building upon the significant efforts already underway regarding the training of China's export control officials and experts. To do so, we have included as a requirement in the successor 123 Agreement that the United States and China jointly provide training to commercial entities in both countries regarding the requirements of the successor 123 Agreement, including controls and policies applicable to exports and imports subject to the Agreement. This training would emphasize the legal obligations that: (1) there would be no diversion of materials, equipment, components, technology, or assistance to non-peaceful or military uses; and (2) there would be no retransfer without prior consent. This is the first time that this kind of training and educational component has been included in any 123 Agreement; neither U.S. nor Chinese commercial entities will be able to claim to be unaware of the terms of the Agreement or their corresponding legal obligations.

Commercial Implications

DOE and State considered many factors in the negotiation of this successor 123 Agreement, including the recognition that China has an advanced civil nuclear program that is heavily dependent on U.S. commercial vendors. The Department of Commerce has identified China as one of the largest and most important markets for the U.S. nuclear industry. China has the fastest growing nuclear energy program in the world with 26 nuclear power plants in operation, 24 under construction, and dozens more planned. China increasingly seeks services, technology, and equipment from U.S. and other foreign commercial vendors for its civil nuclear program. We believe it is in the best interest of the United States to continue to support U.S. vendors' ability to compete in this fast growing market.

The growth of Chinese clean nuclear energy demonstrates its commitment to combatting the challenges of global climate change. Last November, in a Joint Announcement between our two Presidents, China announced its intention to increase the share of non-fossil fuels in its primary energy consumption to around 20 percent by 2030 as part of its effort to meet its post-2020 climate change targets. Nuclear power will be an important part of those targets, providing a significant commercial opportunity for U.S. vendors while advancing U.S. interests in facilitating China's pledge to peak its greenhouse gas emissions by about 2030.

A failure to allow the successor 123 Agreement to go forward would essentially cut off U.S. vendors from this market, constituting a potential serious commercial threat to the overall health and well-being of our civil nuclear industry. For example, DOE invests in a variety of research and development programs that work with industry to develop the next generation of nuclear reactors. These interactions have yielded significant commercial interest from Chinese entities

seeking U.S. nuclear technologies. Absent a successor 123 Agreement, these vendors will be unable to compete in a burgeoning Chinese market.

U.S.-China collaboration on peaceful nuclear cooperation provides us with invaluable insights into not only China's civil nuclear program, but also its science, engineering, and technology programs, as well as its research and development priorities. If the United States fails to replace the expiring U.S.-China 123 Agreement, all of this important work could be put in jeopardy.

Finally, failure to bring the successor 123 Agreement into force with China would significantly impact diplomatic relations and likely eliminate the broad range of U.S.-China cooperative programs that the United States uses to strengthen China's nonproliferation, safety, and security culture in its nuclear industry, which are intended to ensure that China develops its civil nuclear program in a safe and responsible manner. Should Chinese civil nuclear programs no longer be able to rely on technology, material, and equipment from the United States, they will turn to other providers whose nonproliferation and safety standards may not be on par with those of the United States.

Export Control and Peaceful Use Cooperation with China

Bilateral cooperation on the peaceful uses of nuclear technology is governed by the legal framework provided in the subsequent 1998 U.S.-China Peaceful Uses of Nuclear Technology (PUNT) Agreement, which falls under the umbrella of the current U.S.-China 123 Agreement. This cooperation has been invaluable in strengthening both countries' civil nuclear power programs. Without a legal framework to facilitate collaboration with China, the United States ability to influence safety and nonproliferation design considerations in China as it moves forward with the development and deployment of advanced reactor and fuel cycle technologies would be diminished. This is especially important in light of China's growing efforts to promote its technologies worldwide.

DOE/NNSA's export control outreach program is also reliant on the existing 123 Agreement and PUNT framework, which has been working since 2007 in China under the PUNT umbrella. This program has trained over 100 governmental officials per year from six different Chinese agencies that have various export control and internal compliance responsibilities. DOE/NNSA also has trained dozens of additional industry personnel on the subjects of internal compliance and best practices of China's export controls. Provided the successor 123 Agreement is brought into force, DOE/NNSA expects to expand significantly the number of industry officials engaged through a train-the-trainer awareness-raising approach, to underscore the importance of the principal of non-diversion to non-peaceful or military purposes which is outlined under the 123 Agreement.

Science and Energy Cooperation with China

The Department also has broader science and energy cooperation with China that is made possible by the 123 Agreement. Collaboration has been taking place for over thirty years in important areas including high energy physics, magnetic fusion, materials research, synchrotron and neutron science, and topics relevant to environmental management. U.S.-China cooperation in these areas continues to benefit the United States as China has increased its funding

significantly for basic research and our scientists have the chance to work with some of the world China's brightest scientists and engineers. There is also extensive cooperation with China in the area of civil nuclear energy research and development. The scope of this collaboration is broad and deep; it includes advanced R&D in separations technologies, fast reactor technologies and safety analysis, molten salt reactor coolant systems, fuels and materials development, nuclear safety enhancement, spent fuel storage, repository science, and uranium extraction from seawater.

Conclusion

When reviewing the successor 123 Agreement, it is important to consider the specific provisions of all our 123 Agreements. The United States requires our trading partners to provide guaranties consistent with the legal requirements contained in Section 123 of the AEA. These requirements are intentionally stringent and set the global standard for nuclear commerce. It is therefore in the U.S. national interest to encourage other governments that are considering commercial nuclear programs and that are in compliance with their nuclear nonproliferation obligations to sign 123 Agreements with the United States. Our 123 Agreements feature the highest nonproliferation standards, thereby discouraging a nonproliferation "race to the bottom," in which potential partners negotiate peaceful nuclear cooperation Agreements with suboptimal nonproliferation controls.

Replacing the 123 Agreement with China continues a path that Congress started down 30 years ago when the current 123 Agreement was negotiated. Since the 1985 Agreement was negotiated, the United States has witnessed China make great strides in the area of nonproliferation and in its civil nuclear program, even though we know there is more work to do. Some of these strides were made specifically because of the value that China placed on having a 123 Agreement with the United States and the desire to cooperate with the most advanced, safest, and reliable civil nuclear program in the world. Without this 123 Agreement, the United States will lose a critical mechanism for influencing China's nonproliferation behavior, and the insight and transparency into China's nuclear programs as a result of the thirty years of cooperation to date in this area.

Thank you for the opportunity to provide this testimony today.

Mr. SALMON. Thank you.

General Klotz, I would like to begin my questioning with you. Regarding the new technology transfer mechanism in the agreed minute, how would the new process affect the existing technology transfer authorization process under the 810 authorization? Would the agreed minute supplement or replace the 810 authorization?

General KLOTZ. Mr. Chairman, in fact, the 810 authorization process is already a very rigorous review process in which, as the Secretary of Energy considers each of the applications for the transfer of technology, we go and work very, very closely with the other departments, Department of State, Department of Commerce, Nuclear Regulatory Commission, Department of Defense.

And we also consult very closely with the intelligence community. Recall that the Department of Energy is one of the 17 organizations that are part of the intelligence community. And we draw upon the intelligence expertise resident within our national labs.

So that process will continue to be followed for all applications under the 810 process.

Mr. SALMON. My understanding is that under the new agreement, that these transfers are authorized by the agreement itself. Previously, DOE shared these requests, as well as any decisions you made on them with Congress. My understanding is that process is being streamlined and altered pretty dramatically. Is that not a correct understanding?

General KLOTZ. Well, to address the issue of streamlining, we have gone through a number of steps in the past several months in response to direction from Congress, in response to a report rendered by the GAO to make the process for 810 applications more efficient and more transparent.

One of the issues that has been a problem in slowing down that process has been the need for approval of each application, the requirement for the Department of State to go to whatever country that we are considering a 123 Agreement with to get nonproliferation assurances.

What this particular agreement does is to wrap those nonproliferation assurances into the 123 Agreement. In effect, it escalates it from the 810 process into the 123 process, so the nonproliferation assurances are moved to that level of a state-to-state agreement.

So with that, we will still go through the very rigorous, robust vetting of each and every 810 application through the interagency process, which, as I said, includes all of the national security agencies, as well as the Department of Commerce and the Nuclear Regulatory Commission.

Mr. SALMON. I just have a concern that given their likely violation of their pledge not to divert U.S. civilian technology for military purposes under the existing 123, maybe we should be tightening the tech transfer authorizations rather than streamlining them as in the agreed minute. That is my concern.

I am going to yield to Mr. Keating for any questions he might have.

Mr. KEATING. Thank you, Mr. Chairman.

First of all, I would like to thank both of the gentlemen for their service to their country. And I was interested in Mr. Countryman's

opening remarks when he brought up the fact that he thought it would be great to engage in more political intervention.

I realize the nature of the agreement and the importance of the agreement and the time significance with the old agreement, how the world has changed, and the need for this. However, I am curious, since you brought it up, what kind of a political engagement are you considering? What would you recommend, given your background, your prior background as well?

Mr. COUNTRYMAN. Well, I hesitate to make recommendations to Members of the Congress. My point is that we have literally hundreds of issues on the bilateral agenda with China. It is the most complex bilateral relationship in the world today. We have a complex structure of dialogues with China, government to government, and those hundreds of issues are covered.

It is more than possible that the Chinese Government loses sight of what I consider to be a crucial issue, ineffective enforcement of their own trade control laws, they lose sight of that when it is packaged together with the other 99 issues that are essential to the bilateral relationship.

And although the State Department has raised this issue with high levels of the Chinese Government, I think that repetition from a variety of sources will help the Chinese Government to find the will and the resources to more effectively enforce its own laws.

Mr. KEATING. I do suspect that most of the concern this morning will be based on not the agreement itself, per se, but the lack of enforcement. Their dealings with Pakistan and the violating of their own laws.

And I just want to ask both of you, what do you think can be done about their own—to improve their own enforcement? And if you could speculate, I know it is hard to speculate on the Chinese, how much of it is, if any, is their inability to enforce it versus their just compliance and letting that occur? I know that is broad, but I think it is going to be central to what we are probing this morning.

Mr. COUNTRYMAN. First, in terms of enforcement, you should have no doubt, as we have briefed repeatedly and are always ready to brief again, that we have a rigorous examination process before exports of technology are approved and that they include all relevant expertise of the United States Government, not just these two guys here. Our enforcement will be strong, and we have the mechanisms within the 123 to suspend or cease cooperation if there are violations on the Chinese side.

In terms of Chinese enforcement of trade controls, first, Li Fangwei or Karl Lee, who has been mentioned, is not a new name to us. We have worked on this issue for years. We have had some success for the Chinese in limiting his activities. And yet he remains active. I would point out he remains active primarily in the ballistic missile technology realm, rather than in the nuclear realm, and has provided important technology to Iran in that respect.

It is kind of a chicken-and-egg question to say whether the Chinese need to find the will or the resources. They have a Wild West economy with a number of private entrepreneurs who are capable of utilizing both high technology companies and, I assume, good

connections within the Chinese bureaucracy to pursue trade that ought to be controlled.

We strongly believe that the Chinese Government can do more, needs to make a political decision to do more. We will continue to press them to do that. And the 123 Agreement is exactly what provides us the access to continue to press that issue.

Mr. KEATING. General, could you comment, if you could, too, given the shortness of time, also reference the CAP1400 issue in terms of our ability, what we might be able to do to limit which country China goes to export things.

General KLOTZ. Well, let me, if I could, sir, follow up on your original question. Another element of the 123 Agreement, which I think is extraordinarily important, is that the provision that for tech transfers, that we engage in joint training of U.S. entities and Chinese entities on what the requirements of the tech transfer is.

This is very, very important as a means of educating Chinese counterparts of what the specific rules are. We also go through that process in our other engagements across the range of issues associated with safety, security, research, and development on new approaches to reactor design, as well as fuel fabrication.

On the specific issue of the AP1000 and the CAP1400, any tech transfer which is approved by the Secretary of Energy is subject to the provisions within the 123 Agreement on diversion of technology to military purposes and the export or re-export of that technology to other countries. So if that were an issue, that is something that we would address directly and squarely.

Mr. KEATING. Thank you. I yield back.

Mr. SALMON. Thank you.

Chairman Poe.

Mr. POE. Thank you both for being here. And thank you, Mr. Countryman, for being available to answer questions before this hearing to all of us on the panel here.

I would like to look at this from a little higher level. This is an agreement between the United States and China to let us do business with China in the nuclear industry. Is that a fair statement? Civilian nuclear capability.

Mr. COUNTRYMAN. Essentially correct. As General Klotz pointed out, it also provides for other areas of cooperation directly between Department of Energy and counterparts in China.

Mr. POE. But, anyway, it is an agreement to do business in civilian nuclear capability. So we decide we are not going to do that, we are just not going to do business with the Chinese. The void, and just correct me if I am wrong, what would occur is then that our nuclear technology, which I think is the best in the world, bar none, rather than they being in China helping them develop their nuclear capability—and I mean in China, they would be there physically to monitor the construction of these plants. Is that a fair statement?

Mr. COUNTRYMAN. Yes, sir.

Mr. POE. Which is jobs and income to American companies. That is not going to happen. But the void then would be filled by some other country. Is that a fair statement?

Mr. COUNTRYMAN. Absolutely. There are other countries that are eager to sell nuclear power plants to China.

Mr. POE. Like France, Russia maybe?

Mr. COUNTRYMAN. France, Russia, Japan, South Korea.

Mr. POE. Japan. There is a whole bunch. But we are the best in the world, so the China preferably would do business with us because we do it better than anybody else. Is that a fair statement or not?

Mr. COUNTRYMAN. I agree.

Mr. POE. General, do you want to make that comment?

General KLOTZ. No, I would agree with that statement.

Mr. POE. Okay. So not agreeing to do business with them causes a void that is going to be filled by somebody else. And all of the issues that were discussed with the problems, possible problems with the Chinese cheating—I know we would be shocked if they did—are still going to occur, all of those issues are still going to occur with their proliferation with other countries, if they choose to do so. Is that right or wrong?

Mr. COUNTRYMAN. Yes, sir. And our ability to engage with the Chinese on all of those issues will be diminished.

Mr. POE. Because we don't have an agreement to do business with them.

Also under this agreement, does the U.S. Government and our different departments manage and control and authorize what we actually sell to China?

Mr. COUNTRYMAN. Yes.

Mr. POE. Okay.

Let me ask you a question, General. I know you are an Air Force guy, as I was. But I saluted folks like you being just a sergeant. This canned coolant pump, I understand that the submarines, that is the new wave of naval activity throughout the world, and the coolant pump helps them get real quiet. We have heard some concerns about the canned coolant pumps and that technology being transferred to China. Can you fill me in on that?

General KLOTZ. Sir, we discussed that at some length in the closed briefing that we had for members of the committee. As Assistant Secretary Countryman said, we had representatives from naval reactors in the intelligence community there.

I would love to follow up with you on that discussion. Obviously, technology associated with our submarine program and naval propulsion is extraordinary sensitive. So I would be very, very happy to pursue that with you.

Mr. POE. All right. We will follow up on some other basis.

So based on everything you know, both of you, this is my last question, based upon everything you know, the criticism, the concerns, the Chinese, the deal with dealing with them on an arm's length basis, do you recommend that Congress approve or disapprove this agreement?

Mr. COUNTRYMAN. I strongly recommend that we approve it. As the President said in his message, this is in the national security interests of the United States. It succeeds if we implement it faithfully and carefully, and that is what both of our agencies are pledged to do. And, of course, we are pledged to keep the Congress closely briefed as we do so.

General KLOTZ. I would agree——

Mr. POE. General?

General KLOTZ. I would agree, sir. It is important to us both for our nonproliferation objectives, as well as commercial interests in this growing market for nuclear power around the world.

And I am also convinced that we have put into place through this agreement, as well as the 810 process and the other reviews and the way in which we approve specific transfers of technology components, materials, a very rigorous way of ensuring that our interests are protected.

Mr. POE. Thank you.

I yield back, Mr. Chairman.

Mr. SALMON. Thank you.

Mr. Connolly.

Mr. CONNOLLY. Thank you.

General Klotz, I want to make sure I understood your answer to the question about CAP1400. So if we provide a certain technology, nuclear technology to the Chinese and they significantly modify it for retransfer to some other countries, what exactly does this agreement give us by way of right of review and approval?

General KLOTZ. Sir, any technology related to the main nuclear technology parts of a reactor exported from the United States constitutes U.S. technology under the terms of the——

Mr. CONNOLLY. Irrespective of modification?

General KLOTZ. That would have to be something that would be reviewed on a case-by-case basis to determine the level of modification, to what extent U.S. technology was involved, or to what extent indigenous development had taken place.

But any technology that is exported falls under that. And we have informed our Chinese counterparts and companies of our review that inclusion of U.S. technology in the CAP1400 requires U.S. consent prior to its retransfer from China.

Mr. CONNOLLY. And have they agreed to that?

General KLOTZ. I don't think we have gotten to that stage yet where they have exported the CAP1400.

Mr. CONNOLLY. Well, I guess I would just note for you that if I were looking at a list of things that give me concern and pause, that is one of them. Your words notwithstanding, it is not entirely reassuring, especially the caveat that, well, it would depend on the extent of the modification. If I were a Chinese lawyer, that would be a big hole I would drive a big PLA truck through, or at least know I could.

Mr. Countryman, a devil's advocate question, for maybe both of you, but maybe I could start with you. I mean, this is a well-intentioned agreement. It provides a framework without which we don't have any leverage or control. It is a growing market. It looks like China is on track to maybe being the biggest nuclear market by 2030 or 2040, bigger than our own. It certainly is the only big, new expanding market because we are not expanding here that much. If I were Westinghouse, I would definitely want to be in that market.

But your own testimony in May before the other body was that, frankly, they don't have the capability to manage everything they have got, let alone this big expansion, from the point of view of the concerns of this agreement.

We do know they have a history of proliferating. I mean, while they are part of P5+1, and I am glad they are, on the other hand, they helped the Iranian nuclear development program, they helped the Pakistan nuclear development program.

And so what about this agreement gives us any level of confidence that we can deter that pattern of behavior, that we are turning over a new leaf with a reinvigorated agreement from 30 years ago that catches the behavior we have witnessed in that time period when we had an agreement in place? Is it a matter of enforcement? Is it a matter of capability and training? Is it a matter of political will here? Or is it a matter of just a relentless pattern of probing and cheating and clandestine activity by the Chinese Government that, frankly, we are not going to catch and we are not going to deter?

Mr. COUNTRYMAN. Well, thank you, sir. It is a good question. And if the turning point in Chinese behavior were 2015, it would be the crucial question. But,in fact, the turning point in Chinese behavior occurred in the 1990s.

The conditions that Congress established in 1985 on the original Reagan administration agreement included ceasing support to the Iranian and Pakistani nuclear weapons programs. And China did that. It joined the Nuclear Nonproliferation Treaty. It joined the Nuclear Suppliers Group. Its record, as I said, in terms of what we call strategic trade controls, export controls, remains inadequate.

On the question of can they manage all of these obligations, I think that they can manage a large nuclear program. What we are urging them to do is to devote a fraction of the resources, money, and personnel that they devote to managing a big nuclear program to managing an export control program. We believe that they can do that.

Do we take for granted that their performance will improve? No. And the assurances that are contained here are not by themselves adequate. As in every other part of the 123 Agreement, it requires constant, persistent follow-up, and that is exactly what you will have.

Mr. SALMON. Thank you.

The Chair recognizes Mr. Rohrabacher.

Mr. ROHRABACHER. A question not related to today, but does India have nuclear weapons?

Mr. COUNTRYMAN. India has nuclear weapons.

Mr. ROHRABACHER. Okay. My colleague and I were discussing that.

Let me ask you about this. What we are talking about here is setting up a guideline so that we can do business and sell designs that will come from the United States and our designs for a nuclear reactor, a peaceful use of nuclear weapons program. Will we be selling also, does this set the guidelines, will we be selling actual equipment? Will we be exporting equipment that is built in the United States as well?

General KLOTZ. Yes. The agreement serves as a framework for specific authorization, licensing by the Department of Energy and/or the Nuclear Regulatory Commission to do that.

Mr. ROHRABACHER. So we would expect both our technical designs and also our actual machinery to be sent, available to China, as a result of this agreement?

General KLOTZ. Yes. If licensed again, if approved again by the——

Mr. ROHRABACHER. If approved, yes, of course.

Let me ask you this. In terms of the type of nuclear reactor that we are approving, are these light water reactors? Are these the light water reactors that we will be sending?

General KLOTZ. Yes.

Mr. ROHRABACHER. Okay. So light water reactors are—how different will the light water reactors be that—we guaranteed that Japan, for example, would have the ability, and they did, followed through on the foolproof nuclear reactors that we sent them. Are these reactors going to be different than the ones we sent Japan that have proven not to be foolproof?

General KLOTZ. I assume you are referring to the Fukushima accident?

Mr. ROHRABACHER. I would make that assumption, yes.

General KLOTZ. And, of course, that was a seminal event that got the attention of the nuclear industry and nuclear scientists, technicians, and engineers across the world. And a lot of changes have been made domestically in terms of the safety procedures that have been put in place here in the United States and overseas. The Chinese went through a pause in terms of approving new construction and certifying plants that had already been constructed as a result of their review of their own processes and procedures post-Fukushima.

We are moving through successive generations of nuclear reactors. The AP1000 represents a gen III-plus with a lot of passive safety features, which are designed to ensure that the plant remains safe, not necessarily always with human intervention, if there is some major catastrophic breakdown in the system or some external event.

Mr. ROHRABACHER. But they are still light water reactors.

Let me just note that there are new generations people say we are capable of building that would leave light water reactors in the past. Meaning, that is old stuff. And what we are doing is putting little improvements on old technology when you talk about light water reactors.

I am dismayed that our economy and our Government and our establishment here has been unable to go to the next generation of nuclear power, which I understand we are capable of building, which does not have leftover plutonium, for example, and doesn't have the waste problem in terms of—by the way, does this, are we permitting the type of nuclear reactors that will have leftover material that needs to be protected, put into the Yucca Mountain of China for a 1,000 years?

Mr. COUNTRYMAN. In short, yes.

Mr. ROHRABACHER. Okay. Thank you. I think that is absolutely absurd for us to be shipping things like that to China or building them here when we have the capabilities of moving on to a new generation of nuclear reactors that don't have that problem. And I

am on the Science Committee, so I have been involved in this thing for a while.

And we have already talked about the Chinese track record. I don't think the Chinese do have a good track record in terms of it is my understanding that they have had something to do with the proliferation of nuclear weapons to Pakistan, not to mention there is a controversy about how much influence they have on Korea. And Korea has certainly not played a positive role.

Let me ask you this in terms of—well, let me put it this way. The last time I was confronted by these arguments, and I have been here for 26 years, there are two mistakes I have made in Congress.

Number one was to—well, I have made lots of mistake in Congress. But the ones I regret the most were, number one, following George W. Bush into Iraq and just taking his word about they were having a nuclear program in Iraq, which was, I believe, a fraudulent claim because it would have taken them 20 years to build a nuclear weapon or maybe even longer, if they could have ever built it at all. We went into Iraq for some other reason. It was a disaster.

The other thing that I regret, however, the most that I regret, is that when I was talked into agreeing that American satellites could be launched on Chinese rockets. It was back in the 1990s. And I will tell you that we had people just like yourselves here testifying how that in no possibility would there ever be any type of technology transfer, this is going to be so controlled. And guess what happened? We ended up with a major transfer of missile technology to China.

And to the degree that China today threatens us, it threatens us because of the rocket technology, the MIRVing that we provided them, the stage separation that we provided them. And we had people just like yourselves here guaranteeing us that that would never happen.

And I am sure you are very sincere, and I believe you, but I don't believe our system actually is efficient enough to back up the promises that you have made. So I would oppose expanding this type of thing to China.

Thank you very much.

Mr. SALMON. Thank you.

Ms. Gabbard.

Ms. GABBARD. Thank you, Mr. Chairman.

I wonder if you could speak about how you assess this agreement will impact our security interests within the Asia-Pacific region and relationships with our allies and partners.

Mr. COUNTRYMAN. Thank you very much. It is a great question.

First, as I said, in the complex bilateral relationship we have with China, affirming our nuclear relationship, which is at heart a commercial relationship with security controls from our side, is essential to being able to talk to the Chinese as partners, as a growing power with whom we have to contend, who is both a partner and a rival.

The other states of the region, I believe, support this agreement because it provides for an element of stability in the U.S.-China relationship.

I will note that you also have before you the similar 123 Agreement with the Republic of Korea for your consideration. I also recommend it strongly.

These are,in fact, the ROK, China, and Japan, I consider to be our three most important global partners in civilian nuclear power on both the technological and the commercial sense. And so this provides an element of stability.

It also provides, crucially, an important step toward the development of carbon-free energy sources. And Asia is, of course, the region that is more threatened by rising sea levels than any other part of the world.

So I see it only as positive. I am not aware of any criticism from any of our friends in Asia about this agreement.

Ms. GABBARD. Thank you.

General KLOTZ. Could I add to that please? Because it is a very important question.

The way we would look at it, I think, from the Department of Energy and the National Nuclear Security Administration is it is important for all the countries in the region, our allies, China, that if they are going to operate civilian nuclear power programs, that it be done in the safest possible manner, the securest possible manner, with all appropriate safeguards in force.

And so our ability to engage in dialogue with the Chinese on these important issues is extraordinarily important not just for China, but for our allies and partners in the region as well.

Ms. GABBARD. Thank you.

My next question has to do with the effectiveness of both our ability as well as the Chinese Government's ability to monitor and control exports by private companies. My assumption is, and I would like to hear what you have to say, that there is a lot of room for improvement. And if so, what is the plan to improve that area?

Mr. COUNTRYMAN. Well, first of all, I am always impressed when I see the programs administered primarily by the Department of Commerce, but also by other U.S. agencies, that improve the capability of American exporters to watch what they are exporting, to be aware of laws and regulations that change regularly. And major defense and high technology contractors have effective internal control programs that ensure they don't get in trouble with their own government.

We recommend such programs strongly, and, in fact, we have partnered with the Department of Commerce to assist the Chinese in providing that kind of training to major exporters within China. We have encouraged that model.

But it is ultimately the responsibility of the Chinese Government to devote those kind of resources and to make that kind of training, that kind of internal control program a more regular feature among Chinese enterprises.

Ms. GABBARD. If there is an illicit transfer that has been identified by the United States, is China, the Chinese authorities cooperating in how they are handling that or stopping that from moving forward?

Mr. COUNTRYMAN. The record is mixed. There are more cases in recent years of the Chinese taking action to block such transfers, but it is far from a complete or a satisfactory record.

Ms. GABBARD. All right. Thank you.

Thank you, Mr. Chairman.

Mr. SALMON. Thank you.

The Chair yields to Mr. Wilson.

Mr. WILSON. Thank you, Mr. Chairman.

And, Mr. Countryman, while I understand the need for information sharing between China and the United States, both in my home State and in Georgia we have reactors under construction. And can you explain to us what the extent of the construction of Chinese reactors plays in terms of our diplomatic and economic relationship with China?

Mr. COUNTRYMAN. That is a big question, very hard to summarize, sir. As I noted, there are 100 different issues in terms of our bilateral relationship with China. Nuclear trade is very large, and yet it is a small fraction, and I will try to get you a percentage of the overall volume of U.S.-Chinese trade.

It has, however, a political significance that is greater than the actual percentage volume of bilateral trade. It is for the Chinese a recognition that we have a partnership between countries that are approaching the similar level of technological development in the nuclear energy field. And for that reason, it is not a matter of ego, it is a matter of assurance to the Chinese that we take them seriously on issues that are to our mutual advantage.

But hard for me to be more precise given the extreme range of bilateral issues that we work on.

Mr. WILSON. But the bottom line, it is beneficial?

Mr. COUNTRYMAN. Absolutely.

Mr. WILSON. And I appreciate that you recognize the carbon-free energy production. And somehow we need for you to get this message across that carbon-free energy production in China is also carbon-free energy production within the United States, and that it is very beneficial. And somehow the definition in one part of the world should apply around the world. So I appreciate you raising that.

General Klotz, it is always great to see you. I appreciate so much your service to our country. As a member not only of this committee, but the Armed Services Committee with four sons currently serving in the U.S. military myself, ensuring our national security is my top priority.

That said, can you describe and offer assurance to this committee, maybe even to members of the committee from California, that this 123 Agreement takes the necessary measures to ensure China does not divert U.S. commercial nuclear technology for military use?

General KLOTZ. What I can assure you of, Congressman—and I appreciate those very kind words—what I can assure you of is that we have set up, I think, a framework agreement here that is an advance over the 1985 agreement in terms of the processes which are there, the potential downside risk to the Chinese if we come to the conclusion that they are not living up to their agreements in terms of diversion of military technology and the nonproliferation provisions that are written into the 123 Agreement.

And I can assure you that we will be as diligent as the Congressman from California said, we will be as diligent as we can be in

terms of our processes within the executive branch and in consultation with Congress to ensure that we go into each and every one of these applications for technology transfer, component transfer, hardware transfer with eyes wide open.

Mr. WILSON. And I appreciate that very much.

And additionally, Mr. Countryman, what is your assessment of the current proliferation activity between China and Iran or North Korea?

Mr. COUNTRYMAN. First, they are two very different situations with similarities. In the case of Iran, we do assess that Li Fangwei, or Karl Lee, is the most important procurement agent for the Iran ballistic missile program; that he remains active; that although Chinese authorities have frustrated him on some occasions, he remains pretty much free to operate. And that is a primary concern of ours in our dialogue with China, one that we continue to press.

North Korea is a somewhat different case. North Korea is less dependent on outside economies for development of its nuclear and ballistic missile program than Iran is. But it still seeks acquisition of high technology equipment and technology in China, as well as in Russia and in other locations. And we believe that the Chinese Government can and must do more to prevent such procurement networks that are specifically prohibited by United Nations resolutions.

Mr. WILSON. Thank you very much.

Mr. SALMON. Mr. Boyle.

Mr. BOYLE. Thank you. And I want to thank the chairmen and the ranking members of the subcommittees for holding today's important hearing and inviting me to appear.

I introduced, along with my colleague Mr. Wilson, House Joint Resolution 56, the approval resolution of the agreement that we are discussing today, of course, the new 123 Agreement.

In today's testimony, I am directing this probably most appropriately to Mr. Countryman. In today's testimony, and in similar testimony to the Senate Foreign Relations Committee, you said, "The proposed agreement would strengthen the bilateral relationship between the U.S. and China, benefit the U.S. economy, enhance nuclear safety in China, and improve the environment."

Could you expand on these four advantages of the proposed agreement? And if you could specifically focus on the benefit to the U.S. economy and jobs here at home.

Mr. COUNTRYMAN. Okay, I might ask my colleague, General Klotz, to talk a little more about the economic benefit. On the other points, as I have said, it is important to the bilateral relationship, greater, as I said, than the economic value of the agreement itself in both positive and a negative direction. It is an important symbol of partnership and cooperation for the Chinese, and failure to implement it would be taken by the Chinese as a step backwards by the United States from our professed desire to be partners where we can and to manage our differences where we have them.

On the environmental side, the point is that nuclear power is a carbon-free energy source. It is very much, as President Obama has said, part of our all-of-the-above pursuit of clean energy in the United States and around the world. And this is the important contribution it makes.

On nuclear safety, as General Klotz has said, we believe strongly and objectively that U.S. nuclear power plants have the safest design in the world, and more importantly, U.S. involvement on the ground in China helps to inculcate the habits of safety that prevent accidents in the future.

And let me ask General Klotz to talk about economic benefits here.

General KLOTZ. Thank you, Congressman, for the question. I believe in your second panel you will have people who can cite chapter and verse and specific statistics in terms of what the economic impact is in jobs, dollars, and that sort of thing.

But just let me say generally, it has already been pointed out, in terms of nuclear technology we are the best in the world. Our scientists, technicians, and engineers are world class and leaders in this particular field. So from an economic point of view we have a comparative advantage in this commercial sector.

And the benefits for U.S. industry are not just in the sale of a particular piece of hardware, but all the other things that go with it, the post-sale servicing, the technical engineering, the instrumentation and control that affects not just primary vendors, but a host of subvendors across the country in practically every State in this country.

So it is a huge market that is growing there, and it has already been pointed out, if we are not there, someone else will be there. There are other people who build reactors and are aggressively marketing their technology to not just China, but other countries as well.

Mr. BOYLE. Well, thank you.

And I will just say briefly before yielding back, such an important point that this isn't a choice of either we do this or it doesn't happen. No, it is going to happen. The question is, do we do it or do our competitors beat us to it.

Thank you.

And again, I thank the chairman.

Mr. SALMON. Thank you.

Mr. Countryman and General Klotz, we appreciate your time today and your testimony and responses to our questions. Thank you very much.

When Mr. Countryman and General Klotz leave the panel, if we can get the other panel seated as quickly as possible, we would appreciate that.

Mr. SALMON. We are thankful to be joined by a private panel this afternoon as well, and maybe you can answer some of the other questions that were asked up here on economic issues and others.

We are pleased to be joined today by Henry Sokolski. And did I say that right?

Mr. SOKOLSKI. You did.

Mr. SALMON. Close enough?

Mr. SOKOLSKI. No, spot on direct.

Mr. SALMON. All right. Executive director of The Nonproliferation Policy Education Center. Daniel Lipman, vice president for Supplier and International Programs at the Nuclear Energy Institute. And Sharon Squassoni is a senior fellow and director of the Pro-

liferation Prevention Program at the Center for Strategic and International Studies.

And we will start with you, Mr. Sokolski.

STATEMENT OF MR. HENRY D. SOKOLSKI, EXECUTIVE DIRECTOR, THE NONPROLIFERATION POLICY EDUCATION CENTER

Mr. SOKOLSKI. Members of the committee, my message today is pretty simple. Although it would be a mistake to block this deal—and I think the way this hearing has been framed, that seems to be the only question—it is the wrong question. Nobody is blocking this deal. It is going to go through. So you need to go a little bit deeper than that question.

I think you need to approach this deal's implementation with your eyes wide open—someone read my testimony, they used that phrase already once—lest it encourage more Chinese military nuclear diversions and proliferation of the sort already reported by the administration. They want you to go into classified hearings to find out about what is going on. Do it. I think when you do, you should be disturbed.

To avoid this, Congress should condition the agreement two ways that would neither require China's blessing, nor hold up its implementation. I think that is very important. You need to understand where the critics are coming from. They are not going in the direction you are worried about.

First, before the executive authorizes any Chinese recycling of nuclear weapons usable-plutonium, it is called reprocessing, generated in U.S.-designed reactors, the President should certify that he will secure case-by-case authorizations for each reprocessing campaign the Chinese might attempt as the U.S. currently requires of Russia. We are not picking on China, just treating them like Russia.

Congress should also ask the executive to publish a clear definition of what U.S.-designed reactor and reactor components are to clarify what materials require such reprocessing authorization and to take care of this question about the CAP1400, which is a very serious line of inquiry.

Second, the President should certify that the agreement's call for creating preapproved nuclear activities, technologies, and foreign entities won't supersede or interfere with current technology review procedures. Now, to the extent that they claim it doesn't, that should be an easy thing to pass because no one is going to say that they are not doing it. Great. Pass a law. Make sure of that. It doesn't look like that in the annex to me.

Congress also should ask that the Director of National Intelligence participate in current reviews of nuclear technology transfer authorization requests and that these requests be shared with the appropriate committees of Congress as they used to be.

Finally, Congress should ask the intelligence community to assess routinely how Beijing might exploit its civilian infrastructure and American civil nuclear technology for military purposes and what China's future military nuclear requirements might be. I think this needed to be done. You might have avoided some of the problems with the canned coolant pumps. Why bother?

You have mentioned that Chairman Royce 8 years ago, along with several Members, wrote the Defense Secretary about the canned coolant pumps, and they were also concerned about the possibility of reprocessing resulting in nuclear weapon stockpiles. Essentially, they were told don't worry.

Now we are told China probably diverted the pump technology. They don't want to quite say that because it raises legal issues if they actually say it. But it really looks like a duck and it is waddling like that. It looks like they diverted to upgrade it nuclear submarines. To my knowledge, no one has been disciplined for this slip, nor has our nuke tech transfer process been tightened.

The proposed deal, in fact, would loosen this process by creating lists of nuclear activities, technologies, and end uses for preapproval. Industry has long pined for such streamlining. Congress approves it for a country that is suspected of having diverted nuclear technology, count on industry in other countries, including the riskiest ones, demanding similar treatment.

The deal also gives China advance consent to extract as much nuclear weapons-usable plutonium as it wants from spent fuel generated in U.S.-designed reactors. All China must do is settle up front on safeguards and physical security. Unlike the nuclear deal we cut with Russia which requires approval for each effort to reprocess U.S.-origin spent fuel case-by-case, this deal gives blanket advance consent that only our closest allies enjoy.

The security implications regionally of this are potentially enormous. Japan is contemplating opening a large plutonium reprocessing plant next spring capable of producing 1,500 bombs' worth of plutonium a year. If Congress fails to further condition Chinese reprocessing, both China and Japan are more likely to proceed. This, in turn, would pressure South Korea to renew its demand that the U.S. allow it to reprocess. Within 10 to 20 years, expect tens of thousands of weapons' worth of plutonium mounting up in East Asia.

As my former boss, Andrew Marshall at the Office of Net Assessment, has written, this could produce a potential nuclear avalanche that could be triggered by the least provocations.

In conclusion, you have a chance to wire brush this deal. Regrettably, in 1957, Congress didn't even bother to review the 123 with Iran. Sixty-two years later, we now know how that turned out.

[The prepared statement of Mr. Sokolski follows:]

Conditioning the U.S.-PRC Nuclear Cooperative Agreement against Further Military Diversions

Testimony

of

Henry D. Sokolski
Executive Director
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Given before a Joint Hearing,
"Reviewing the U.S.-China Civil Nuclear Cooperation Agreement,"
of the House Subcommittees of the House Committee on Foreign Affairs
on Asia and the Pacific and on Terrorism, Nonproliferation, and Trade

Rayburn House Office Building, Room 2172
Washington, DC

I want to thank Chairmen Poe and Salmon, Ranking Members Keating and Sherman, members of the subcommittees for inviting me to testify here today on the U.S.-PRC civil nuclear cooperation agreement and its nuclear proliferation implications. My message today is that although it would be a mistake to block the deal, our government needs to approach its implementation with its eyes wide open lest it encourage further Chinese military nuclear diversions and proliferation. China is already under suspicion of having diverted canned coolant pump technology to its submarine reactor program from the AP 1000 reactor design. We need to prevent further, more serious military diversions.

Towards that end, Congress should condition this agreement in two ways that do not require China's blessing and that will not hold up its implementation:

1. First, before any recycling of nuclear weapons usable plutonium from spent fuel generated in U.S.-designed reactors is authorized, require the President to certify that the U.S. will secure case-by-case authorizations for each reprocessing campaign the Chinese might attempt, as the U.S. currently requires of Russia.

    a. In support of this requirement and the agreement's proposed controls over retransfers of U.S. nuclear equipment, components, and related technology, instruct the Executive to publish a clear definition of what a "U.S.-designed" reactor and U.S.-export controlled reactor component are in the Federal Register.

2. Second, have the President formally certify that the agreement's call for creating pre-approved nuclear activities, technologies, and foreign entities retransfer lists will in no way supersede or interfere with current implementation of existing case-by-case review procedures promulgated under 57b of the Atomic Energy Act.

    a. In support of this requirement, ask that the Executive Branch to include the Director of National Intelligence in the coordination of all nuclear technology transfer authorization requests and that these requests and their final disposition be shared with the appropriate committees of Congress.

These conditions could be made part of a resolution of conditional approval before the U.S.-PRC agreement comes into force or be made law after the deal comes into force. Congress did the latter once before, following the Tiananmen Square massacre (see P.L. 101-246).

In addition to these conditions, Congress should also require our intelligence community produce a routine assessment of how Beijing might exploit its own civilian nuclear infrastructure and American nuclear technology for military purposes, and what might drive its future military nuclear requirements. Arguably, it was the lack of such systemic analysis that allowed the Executive Branch in 2007 to dismiss Congressional concerns that canned coolant pump technology might be diverted under the existing nuclear cooperative agreement.

Why Bother?

On May 18, 2007, Chairman Royce along with Congressmen Jeff Fortenberry, Christopher Smith and Congresswoman Diane Watson wrote then-Secretary of Defense Robert Gates that U.S. Curtiss Wright canned coolant pumps might be diverted to upgrade China's nuclear submarine reactors. They also thought the loose requirements on China reprocessing U.S.-origin spent fuel into nuclear weapons-usable plutonium needed to be tightened. Essentially, they were told by the Executive Branch and the nuclear industry that there was no cause for concern.[1]

This brush off, however, was misguided. As we now know, the Executive Branch now suspects China diverted the canned coolant pump technology from the Westinghouse AP 1000 reactor to upgrade its nuclear submarine reactors. At a hearing on May 12th, Senator Bob Menendez more than suggested that from his reading of the intelligence that China had clearly diverted the technology in violation of the existing nuclear cooperation agreement.

To my knowledge, no one has been disciplined within our government nor has any change been made to our government reviews or assessments of nuclear technology transfer authorization requests from industry. Worse, rather than tighten these procedures, by coordinating these requests with the intelligence community or Congress, the proposed deal would fast track or streamline these authorizations by creating lists of nuclear activities, technologies and end uses for which "pre-approvals" would be possible. Industry, of course, has long pined for such a streamlining. If Congress allows it to be adopted for a country that has diverted or is strongly suspected to have diverted U.S. nuclear technology, though, industry is sure to get its way with every other case, including the very worst.

Of course, the deal does not just streamline nuclear technology and component transfers. It also gives China advance consent to extract as much nuclear weapons-usable plutonium as China wants from spent fuel generated in U.S.-designed reactors. All China must do to begin reprocessing is settle one time up front with the U.S. on physical security and safeguards arrangements. This will not be that difficult to meet. Unlike the nuclear deal the U.S. cut with Russia, which requires that the U.S. approve each and every Russian effort to reprocess U.S.-origin spent fuel case-by-case, the China deal gives blanket advance consent that the U.S. only grants its closest allies.

The security implications of such reprocessing could be quite significant. Westinghouse claims 40 of its AP 1000 reactors may be operating in China before the new, proposed nuclear deal runs out. Using conservative estimates, each one of these reactors can generate enough

1. See Mark Clayton, "China, Nuclear Technology, and a Sale," *Christian Science Monitor,* May 30, 2007, available at http://www.csmonitor.com/2007/0530/p03s01-usfp.html.

plutonium for about roughly 37 weapons-grade or 48 reactor-grade nuclear weapons annually.[2] If all 40 were operating, this would equate conservatively to between 1,500 and 1,900 warhead equivalents a year, i.e., nearly the total number of nuclear weapons the U.S. currently has deployed. These estimates, it should be noted, do not include the plutonium that would be generated in China's scaled up copy of the AP 1000, the CAP 1400, which China expects to build in large numbers for domestic use and export.[3]

China has not yet decided to reprocess on a commercial scale. It has a pilot plant. It has reported to have produced only a minuscule 13.8 kilograms of separated plutonium.[4] Chinese nuclear experts I have spoken with understand that reprocessing will cost far more than any benefit it will impart. Several emphasized that assuring that the current light water reactors in China are safe is far more important and urgent than starting up any fast reactor program.

That said, AREVA, which is owned by the French government, just announced that it and China are now entering the final stages of negotiation over the possible construction of a reprocessing plant designed to produce between 1,500 reactor-grade and 2,000 weapons-grade bombs'

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2. See The Center for Global Security Research, "Verifying the Agreed Framework," (UCRL-ID-142036 CGSR-2001-001), April 2001, pp. 49 and 64, available at http://fsi.stanford.edu/sites/default/files/VAF-June.pdf. The Department of Energy estimate of 4 kilograms of plutonium per device is assumed for a first-generation weapons-grade device. 5.2 kilograms or 30 percent more is assumed for a similar reactor-grade explosive. For more details see Richard L. Garwin, "Reactor-Grade Plutonium Can be Used to Make Powerful and Reliable Nuclear Weapons," August 26, 1998, available at http://fas.org/rlg/980826-pu.htm and Thomas B. Cochran and Christopher E. Paine, "The Amount of Plutonium and Highly-Enriched Uranium Needed for Pure Fission Nuclear Weapons," April 13, 1995, available at http://fas.org/nuke/intro/nuke/design.htm.

3. When asked May 12th at the Senate Foreign Relations Committee if such reactors would be considered to be "U.S.-designed," the administration witness noted that what is or is not "U.S.-designed" is largely left to U.S. nuclear exporters determine. In the case of Toshiba-Westinghouse and Hitachi-GE, this should be a worry since U.S.-developed reactor design information is often sold to sweeten their reactor export offerings.

4. International Panel on Fissile Materials, *Global Fissile Material Report 2013,* P. 22, available at http://fissilematerials.org/library/gfmr13.pdf.

worth of plutonium annually.[5] This is substantially more plutonium than what China currently has on hand or could otherwise produce in its dedicated military production reactor.[6]

The immediate danger such reprocessing and our 123 deal's lax controls over it pose is not so much a focused, Chinese military nuclear build up as it is a broader, regional fissile material production race in East Asia. I just returned from a week-long visit with government experts and officials in Tokyo, Seoul, and Beijing. I was accompanied by several U.S. nuclear experts including a former U.S. Nuclear Regulatory Commissioner, a former nuclear weapons designer, and a former senior intelligence official. What we learned was worrisome.

Japan is contemplating opening a large plutonium reprocessing plant next spring at Rokkasho capable of producing 1,500 reactor-grade bombs' worth of plutonium a year. If Congress green lights the proposed PRC 123 without any further conditions on reprocessing, both Japan and the AREVA deal are likely to go ahead with little or no consideration of what the security implications might be. This, in turn, would put tremendous pressure on Seoul to demand that the U.S. allow it to recycle plutonium under the new deal. Allowing any or all of these things to proceed would mean that tens of thousands of weapons' worth of plutonium would mount up in East Asia well before it might ever be used. The way to think about this is as my former boss, Andrew Marshall of the Pentagon's Office of Net Assessment described it, as a nuclear avalanche in the making, just waiting to be triggered by the least provocation.[7] Clearly, letting this happen is in no one's interest.

But Won't Conditioning the Deal Hamper Industry?

The nuclear industry and Administration officials, of course, downplay these concerns. We are talking to China about nuclear proliferation in other forums, they argue. The Chinese are likely to proliferate anyway. On the other hand, we should not cut ourselves off from the business

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5. See CRIENGLISH, "France's AREVA Signs Agreements with Its Chinese Partners, EDF," July 5, 2015, available at http://english.cri.cn/12394/2015/07/01/3742s885300.htm .

6. According the Congressional Research Service, China currently has enough weapons plutonium stockpiled (1.8 tons) to make 450 nuclear weapons. It could also possibly restart its one military production reactor to make 75 bombs' worth of plutonium a year. See, International Panel on Fissile Materials, http://fissilematerials.org/library/gfmr13.pdf and Mark Holt, Mary Beth D. Nitkitin, and Paul K. Kerr, "U.S.-China Nuclear Cooperation Agreement," (Washington, DC: Congressional Research Service, RL33192, June 4, 2014), available at http://fas.org/sgp/crs/nuke/RL33192.pdf .

7. See Andrew Marshall, foreword to Henry D. Sokolski, *Underestimated: Our Not So Peaceful Nuclear Future* (Washington, DC: NPEC, 2015), p. xi , available at http://www.npolicy.org/books/Underestimated/Full_Book.pdf.

and possible influence it might afford. The French and other nuclear vendors will only take up the business the U.S. would otherwise ply. The Chinese, moreover, will never want or need more than the 450 additional nuclear weapons they could fashion out of the military plutonium they now have. Besides, weapons-grade plutonium is best made in dedicated military reactors.

Although handy, much of this argumentation is misleading. Only a few members of Congress are considering voting to disapprove the nuclear deal. Most, instead, are focused on how to condition its approval, as Congress did with the original PRC nuclear agreement back in 1985.

Nor is losing manufacturing jobs to other nuclear exporters all that likely or even possible. In fact, the only major U.S.-headquartered nuclear reactor exporter, Westinghouse, is entirely owned by Japan (Toshiba 87% and IHI 3%) and Kazakhstan (Kazakatom 10%). All of the proceeds from any Westinghouse export to China go entirely to these overseas stockholders. In addition, almost no U.S. manufactured nuclear good that requires a Nuclear Regulatory Commission export license is any longer being made in the U.S. U.S. firms are making canned coolant pumps (Curtiss-Wright and Enertech) and special valves (SPX Corporation) for the AP 1000, but because China wants to make these components itself, it is unlikely these U.S. manufacturing efforts will grow.

Also, the only French reactor exporter, AREVA, is so bedevilled by financial and technical setbacks it is no longer considered a major player in the reactor export business.[8] As for the Japanese and Koreans, their nuclear efforts are technically tied to continued technology transfers from the U.S. They are not going to undercut the U.S. on nonproliferation conditions. Finally, the Chinese have a multitude of reasons to avoid relying on the Russians, who they are more likely to have to compete with in the next three decades diplomatically, economically, and militarily. For all these reasons, and because China sees U.S. reactors both literally and figuratively as its safest bet, industry experts believe the Chinese will rely most on the AP 1000 series for domestic nuclear electrical production along with their own version, the CAP 1400.[9]

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8. See, e.g., Energy Collective,"AREVA Struggles to Dig Out of Debt," March 25, 2015, available at http://www.theenergycollective.com/dan-yurman/2208496/areva-struggles-dig-out-debt; John Lichfield, "UK Nuclear Strategy Faces Meltdown As Fault Are Found in Identical French Project," *The Independent,* April 18, 2015, available at http://www.independent.co.uk/news/uk/home-news/uk-nuclear-strategy-faces-meltdown-as-faults-are-found-in-identical-french-project-10186163.html; and Stephen Chen, "French Warnings on Nuclear Reactors Being Built in China's Guangdong," *South China Morning Post,* April 15, 2015, available at http://www.scmp.com/news/china/article/1762861/french-warning-nuclear-reactors-being-built-guangdong .

9. See, e.g., Steve Kidd, "Prospects for Nuclear Power Internationally after Fukushima," April 25, 2013, Buenos Aires, available at http://ecc.rjdigital.co.uk/wp-content/uploads/2013/05/Argentina-Seminar_0413.pdf.

As for China's future nuclear weapons requirements, the jury is out. If relations with India, Russia, Japan and the U.S. go south, China may want many more nuclear weapons than it currently has or could quickly make. Luckily, we are not there yet.

Conclusion

This ought to be good news. It means the U.S. has leverage to condition the deal without unnecessarily antagonizing China or risking important sales. Moreover, by conditioning and slowing the riskiest aspects of this deal – the lax controls over reprocessing and nuclear transfers – the U.S. can buy time it needs to address the energy and security concerns of our closest East Asian allies -- Japan and South Korea – to head off what might otherwise be a dangerous, regional nuclear competition. Here, the modest steps outlined can head off the worst. Not taking them will invite it.

Mr. SALMON. Thank you.
Mr. Lipman.

STATEMENT OF MR. DANIEL LIPMAN, VICE PRESIDENT, SUPPLIER AND INTERNATIONAL PROGRAMS, NUCLEAR ENERGY INSTITUTE

Mr. LIPMAN. Thank you, and good morning, Chairmen Poe and Salmon and Ranking Member Keating. I appreciate the opportunity to be here.

I also would like to thank Representative Boyle and Representative Wilson for offering their resolution to approve this new agreement.

And I would be remiss if I didn't also thank Chairman Poe and Ranking Member Keating for their hearing in May regarding trade promotion agencies and U.S. foreign policies. We were here to talk about the 123, but when you talk about nuclear exports, financing and the Export-Im Bank is critical and improves the competitiveness of our industry, just as this 123 has a critical impact on the competitiveness of our industry.

You have all talked earlier, so I won't belabor what was said about the job creation and other benefits economically, but I would add that what some people may not know is today there are over 40 American companies doing business in China, of all sizes, large and small, and they do it in a wide variety of technical and commercial applications.

So this agreement, in addition to having had benefits from job creation and revenue creation, have also hit on a couple of other major national interests, and that is nuclear safety and nuclear nonproliferation.

Mr. Rohrabacher, I think correctly, and I would agree, brought up earlier the notion of the importance of nuclear safety. It is something that all of us in the U.S. nuclear industry think about all the time. And having this agreement in place will allow us to cooperate on advanced nuclear technologies that do improve safety, as Mr. Rohrabacher suggested.

So the timing is important in this agreement. Yes, it is a growing market, but China is expanding at a rate that requires our engagement right now. We are well positioned in the U.S. industry for success in China. You have discussed the landmark AP1000 contracts, of which I was very proud to be a part. There are currently another 10 reactors being discussed and a third tranche of about another 30 plants.

But we are, as some of you have said, not the only potential partner. There are others out there who would like to take our place, to be involved, as we are, in a critical role in the Chinese nuclear industry.

So I am going to conclude by really saying, if the U.S. industry is not permitted to participate in the Chinese market, it impacts our reliability as a supplier and the Chinese do have other options. We are not their only potential partner.

Our abdication of this key market results in the loss of very high-paying jobs in technology and a loss of U.S. influence, as Secretary Countryman said, in nonproliferation, and I would argue also in nuclear safety and nuclear security.

If the U.S. were to terminate or significantly curtail cooperation with this market, it is also going to have spillover effects in other potential nuclear markets. Think about what it would look like if you are a country that is thinking of purchasing U.S. nuclear technology if they see a U.S. agreement with China being fraught with difficulty and not renewed, or somehow encumbered.

So we in the industry urge you to allow this new agreement to enter into force without delay or without undue encumbrance on commercial cooperation or export licensing.

I look forward to your questions. Thank you very much.

[The prepared statement of Mr. Lipman follows:]

Testimony for the Record

Daniel S. Lipman
Vice President, Suppliers and International Programs
Nuclear Energy Institute

Committee on Foreign Affairs
Subcommittees on Asia and the Pacific and
Terrorism, Nonproliferation, and Trade
U.S. House of Representatives

Joint Subcommittee Hearing:
Reviewing the U.S.-China Civil Nuclear Cooperation Agreement
July 16, 2015

Chairmen Poe and Salmon and Ranking Members Keating and Sherman, thank you for the opportunity to testify today on this important issue. I am Daniel Lipman, vice president for suppliers and international programs at the Nuclear Energy Institute[1] (NEI). More than 315 NEI members represent all aspects of commercial nuclear technology, from nuclear power plant operators, reactor vendors and major architect/engineering firms to fuel suppliers, component manufacturers, educational and research organizations and labor unions. On behalf of our members, we appreciate the opportunity to provide testimony on the future of civilian nuclear energy cooperation between the United States and China to the House Foreign Affairs Committee Subcommittees on Asia and the Pacific and Terrorism, Nonproliferation, and Trade. NEI and our members also thank Rep. Wilson and Rep. Boyle for offering their resolution to approve the new U.S.-China agreement for civil nuclear cooperation.

During the past decade, U.S. civilian nuclear energy cooperation with China under the current Section 123 agreement has brought significant economic benefits to American workers, the U.S. economy and has advanced important national interests, including nuclear safety and non-proliferation. The industry expects that the new U.S.-China agreement under review by Congress will bring even greater benefits and therefore supports its entry into force without delay or undue encumbrance on commercial cooperation or export licensing.

China's Nuclear Energy Program

China has a rapidly maturing nuclear energy program and will be the epicenter of nuclear energy development for decades to come. This is due in large part to China's growing demand for clean and reliable energy technology. China produces more electricity (5.65 trillion kilowatt-hours in 2014[2]) than any other country. Nuclear energy accounts for just 2.4 percent of China's

[1] The Nuclear Energy Institute is responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including regulatory, financial, technical and legislative issues. NEI members include all companies licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel cycle facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.
[2] CIA World Factbook, China Energy Sector, June 26, 2015 (https://www.cia.gov/library/publications/the-world-factbook/geos/ch.html).

electricity generation[3] but is expected to play a growing role in future years as China makes major investments to meet growing electricity demand while working to meet its clean air and climate goals.

China operates 27 nuclear energy generation facilities. With 24 reactors under construction and another 14 slated to begin construction by 2017, China is the world's largest market for nuclear plant construction. By 2030, China is expected to be operating the largest nuclear energy program in the world with an installed capacity exceeding 133 gigawatts. A recent market assessment by UxC (Attachment 1) estimates that China will account for 43 percent of the new nuclear energy capacity installed globally through 2040.

The Chinese operating fleet is composed of several reactor designs, including designs from Canada, France and Russia, as well as indigenous designs. There are four U.S.-supplied reactors (Westinghouse AP1000s) under construction in China with the first reactor scheduled to come online next year. China's near- to mid-term nuclear energy construction plans focus on the use of Westinghouse AP1000 technology, including the Chinese indigenized design CAP-1400, and an indigenous reactor design known as Hualong One. China also has plans to develop advanced reactors such as high temperature gas-cooled reactors and fast reactors and to become a nuclear exporter in the global nuclear market.

Economic Impacts of U.S.-China Nuclear Trade

With the extensive delays in implementation of the 1985 agreement for civil nuclear cooperation with China, significant U.S. commercial cooperation did not begin until nearly 20 years after the agreement was signed when Westinghouse submitted its bid to sell four reactors to China. During the past decade, U.S.-China cooperation has resulted in approximately $12.5 billion in U.S. exports. A major participant in the Chinese market, Westinghouse, has reported that the current AP1000 program in China has allowed the company to hire thousands of additional staff and has generated thousands more jobs at more than 100 Westinghouse suppliers in more than two dozen states.

Experience has shown that, as with large nuclear development programs elsewhere, the percent of U.S. content in subsequent reactors that are constructed in China will decline. However, as we have seen in the case of other major nuclear markets like South Korea and Japan, the U.S. industry remains significantly engaged in reactor development in the partner country and often partners with indigenous companies on projects in third countries. In the case of China, industry expects that U.S. content in each subsequent Chinese reactor will be less than that in the first four reactors that were constructed. However, U.S. nuclear exports will still be significant and the rapid expansion of the nuclear construction program in China will provide, in the aggregate, strong and sustained U.S. nuclear export opportunities for reactor construction.

With contracts under negotiation to build additional AP1000 reactors in the near term and plans for even more after that, U.S. firms like Westinghouse and their U.S.-based suppliers stand to see significant opportunities in the Chinese market for decades. According to UxC's analysis, U.S.

[3] IAEA Power Reactor Information System, June 26, 2015, (https://www.iaea.org/pris/CountryStatistics/CountryDetails.aspx?current=CN)

exports for nuclear plant construction in China are expected to be in the range of $3 billion to $7 billion per year through 2040.

As Chinese nuclear energy plans become a reality and more plants enter operation, the market for U.S. nuclear energy companies to support ongoing maintenance, modification and operation of a growing nuclear industry will expand commensurately. Each nuclear plant that is brought into operation will provide the U.S. industry with a 40- to 60-year opportunity to provide ongoing support services and products. With this service and support, U.S. companies will continue to share operational safety expertise and culture that will help ensure safety and security. UxC recently estimated the value of this export opportunity growing from $300 million to $500 million annually through 2020 to $1 billion annually by 2030 and $2 billion annually by 2040. This would equate to roughly 2,500 jobs today and grow to more than 9,000 U.S. jobs by 2040.

Beyond nuclear plant construction and support for existing nuclear plants, the U.S. export opportunity in China includes the fuel-cycle market and project development in third countries. Through 2040, the direct economic benefit to the U.S. of the renewed nuclear cooperation agreement with China is expected to be between $70 billion and $204 billion, with between 20,000 and 45,000 direct American jobs supported annually. In addition to these direct jobs, indirect jobs and induced jobs will be created, further benefitting the U.S. economy. In Westinghouse's case, the company reports that its direct sub-suppliers for the current China projects include firms in more than two dozen states, and the suppliers to their direct sub-suppliers operate in nearly every state. In the absence of an expanding U.S. reactor construction program in the near term, it is this type of impact that will help ensure a strong and vibrant nuclear supply chain in the United States.

In addition to the exports and related jobs they support, U.S. electricity consumers will also see real benefit from renewal of the U.S.-China agreement. The first-of-a-kind AP1000 reactors under construction in China are imparting important lessons-learned and technical insights to the four AP1000 reactors under construction in Georgia and South Carolina. This exchange is an important input to startup testing, plant commissioning and training of plant personnel for U.S. reactors. In future years, this exchange will assist U.S. nuclear operators in achieving greater efficiency in maintenance and refueling with consequent savings for U.S. consumers.

Finally, the agreement is critical to allowing the continuation of research and development that will be the basis for advanced reactor designs. For example, TerraPower in Washington state is collaborating with Chinese partners to develop its innovative fast reactor design, known as the traveling wave reactor. If successful, this project will establish U.S. leadership in the market for Generation IV reactor designs.

International Policy Objectives

U.S. nuclear cooperation with and commercial engagement in China advances America's global nuclear safety, security and nonproliferation goals. It also helps China meet its climate goals, as nuclear energy is expected to be China's fastest growing source of non-carbon emitting electric

generation through 2030. Continuation of U.S. cooperation will help support China's plans to expand its nuclear energy generation capacity with U.S. technologies.

U.S. commercial involvement ensures the highest possible levels of nuclear power plant safety and reliability, maintains U.S. leadership in nuclear energy technology and strengthens U.S. influence over global nuclear nonproliferation policy and practices. Noted national security experts agree that "one of our nation's most powerful tools for guaranteeing that countries acquiring this [nuclear] technology continue to use it exclusively for peaceful purposes is to ensure that the U.S. commercial nuclear industry continues to play a leading role in the international civil nuclear marketplace."[4]

The U.S.-China agreement provides critical nonproliferation benefits. These include significant commitments to safeguard materials, to prevent material diversion for non-peaceful purposes, and to provide security for these materials. U.S. nuclear cooperation with China since 1985 helped to influence significant advances in China's nuclear nonproliferation policies and practices. China signed the Nuclear Nonproliferation Treaty, entered into a safeguards agreement and Additional Protocol with the IAEA and joined the Nuclear Suppliers Group. It has, from all available public evidence, moved from being a state engaged in proliferation activities to one that is serious about implementing nuclear export controls (notwithstanding occasional lapses in enforcement). Further, U.S. industry is heartened by the U.S. government's intention in the context of the 123 agreement with China to work to improve export control compliance. We are also encouraged by the Administration's initiative to control nuclear technology transfers under the 123 agreement. This will provide for greater transparency and predictability, which are critical to U.S. industry's competitiveness.

With the world's largest civilian nuclear energy program, the U.S. industry is recognized for reliability, safety and operational excellence. U.S. firms are making major investments in technology development to continue their tradition of innovation. U.S. equipment and technology exports have enabled China to deploy the safest technologies. China is building a fleet of advanced Westinghouse AP1000 power plants, ensuring deployment of the first Generation III+ reactor to receive design certification from the U.S. Nuclear Regulatory Commission. After a nuclear power plant is built, U.S. firms can remain engaged throughout its operation, which can last half a century or more, thus maintaining a physical presence at nuclear facilities and influence over safe operating practices. China's adoption of U.S. technology has deepened U.S. relationships with China's nuclear energy sector.

Conclusion

Continuation of nuclear cooperation with China provides the United States a unique opportunity to meet several national imperatives at the same time: (1) increasing U.S. influence over nuclear nonproliferation policy and practices in the fastest growing and soon to be largest global market for nuclear energy goods and services; (2) ensuring the highest possible levels of nuclear power plant safety and reliability, by exporting U.S. advanced reactor designs and America's world-

[4] April 25, 2013, letter to President Obama from Senator William S. Cohen, Dr. James Schlesinger, Admiral Michael Mullen, Dr. John Hamre, General Brent Scowcroft, General James Jones, Senator Pete Domenici and Ms. Susan Eisenhower (Attachment 2).

class operational expertise; (3) assisting one of the world's largest economies to meet clean air and climate change goals; (4) maintaining U.S. leadership in nuclear energy technology; and (5) creating tens of thousands of American jobs and maintaining a healthy domestic manufacturing base for nuclear energy technology and services.

U.S. industry is well positioned to gain significant benefits from exports to the Chinese market. It would, however, be naïve to believe that the Chinese cannot realize their nuclear energy development goals without the United States. The Chinese have other options. If Congress chooses to prevent U.S. industry from participating in the Chinese market and accruing the benefits outlined above, other vendor nations like Russia and France will benefit. It will also drive the Chinese to accelerate indigenization plans with a corresponding loss of high-paying technology jobs in the United States and a loss of U.S. influence on nuclear safety, security and non-proliferation policies. In addition, it will signal to other nations that the United States is not a serious or reliable partner if it were to terminate or significantly curtail cooperation with the largest commercial nuclear market in the world.

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Attachment 1: *Economic Impacts of U.S. Nuclear Exports to China*, The Ux Consulting Company, LLC, June 2015.

Attachment 2: National security experts' joint letter to President Barack Obama, April 25, 2013.

June 2015

Economic Impacts of U.S. Nuclear Exports to China

The Ux Consulting Company, LLC (UxC) has prepared this special analysis on the topic of U.S. Nuclear Exports to China with a specific focus on the economic and trade impacts of China's nuclear energy program on the U.S. economy. As the current U.S.-China Peaceful Nuclear Cooperation Agreement (123 Agreement) will expire in December 2015, President Obama has submitted a 30-year renewal of this agreement to the U.S. Congress for review. In order to help inform policymakers and other stakeholders, this summary report presents the key findings from UxC's work, including data and analysis on the economic impact of U.S.-China nuclear trade to date. Furthermore, this report forecasts the outlook for future nuclear trade between China and the U.S., with a specific focus on U.S. nuclear exports and their jobs impacts on the U.S. economy over the next 25 years.

Forecasts for China's Nuclear Power Program

With nearly half of all the world's new reactors currently under construction, China has emerged as the most critical market for nuclear energy. The country is expected to account for about 43% of the nuclear generating capacity installed in the entire world between now and 2040 under a Base Case scenario. China is therefore destined to be the main global driver for nuclear energy expansion over at least the next two decades, and likely for even longer.

UxC's Base Case forecast shows that China should reach around 26.5 GWe from 30 units by the end of 2015 based on the current reactor projects under construction. By 2020, we predict 50 units producing a total of 47 GWe, which is well below the official government nuclear power target of 58 GWe due to our reading of the current pace of construction and likely delays with projects that will commence construction in the coming few years due to the deployment of new reactor designs. However, by 2025, we foresee China's growth rate ramping up more quickly, with 92 units (91 GWe) in operation, and for 2030, our updated Base Case shows 129 units producing 133 GWe. Our current long-term 2040 outlook remains bullish about continued reactor growth in China with 199 operating units for a total of 227 GWe in capacity.

Table 1 shows UxC's current list of near term reactor construction starts in China, which amounts to 14 units and nearly 16 GWe. As this data demonstrates, nearly all near-term projects will be based on either Westinghouse's AP1000 or domestic Chinese designs. China appears to be targeting the deployment of mainly two types of nuclear reactor designs in the future, the localized AP1000 (and follow up versions such as the CAP1400) and the Hualong-1 reactor. The new AP1000 projects are currently in various stages of licensing. According to UxC's estimates, three reactors will start construction in 2015, seven in 2016, and four in 2017. Additional projects beyond 2017 are highly likely, and therefore these numbers are expected to increase once there is more detailed information about specific new reactor projects.

Table 1. Near Term Planned Reactors in China (Listed by Estimated Construction Start)				
Reactor	**Owner**	**Design**	**MWe net**	**Constr. Start**
Fangchenggang 3	CGN	Hualong-1	1,000	2015
Hongyanhe 6	CGN	ACPR-1000	1,000	2015
Shidaowan II-1	Huaneng	CAP1400	1,400	2015
Fuqing 6	CNNC	Hualong-1	1,000	2016
Xudabao 1	CNNC	AP1000	1,117	2016
Sanmen 3	CNNC	AP1000	1,117	2016
Lufeng 1	CGN	AP1000	1,117	2016
Fangchenggang 4	CGN	Hualong-1	1,000	2016
Haiyang 3	CPIC	AP1000	1,117	2016
Shidaowan II-2	Huaneng	CAP1400	1,400	2016
Xudabao 2	CNNC	AP1000	1,117	2017
Sanmen 4	CNNC	AP1000	1,117	2017
Lufeng 2	CGN	AP1000	1,117	2017
Haiyang 4	CPIC	AP1000	1,117	2017
Total: 14			**15,736**	

U.S. Participation in China's Nuclear Industry

Numerous American companies are involved in providing services and technology to the Chinese nuclear market, and these companies generate revenue and employment opportunities in several U.S. states. The projects that have benefitted from American supplies are not only the AP1000 projects, but also the French EPR design as well as Chinese domestic reactor designs. Moreover, based on joint ventures and strategic partnerships signed over the past decade, American companies are also expected to be involved in future reactor plans in China, such as additional AP1000 units and the follow-up version CAP1400. Finally, there are also plans to cooperate with Chinese companies in order to support reactor projects overseas, such as in the case of Turkey. UxC counts at least 40 separate U.S. companies that are active in the Chinese nuclear market through either existing contracts, joint ventures, and/or ongoing marketing initiatives.

Based on available information, Table 2 presents UxC estimates of the total economic impact over the past decade for all U.S. commercial agreements related to China's nuclear energy program. Note that this data reflects the sum total for roughly the period 2005-2015.

Table 2. Total Value and Job Impacts of Past and Current U.S. Commercial Nuclear Agreements in China	
Total U.S. Exports to China (2005-2015)	$12.15 billion
Annual Average over Ten Year Period	$1.2 billion

As the above table indicates, U.S. companies have already benefited substantially from the rapid expansion of China's nuclear energy market. Moreover, it is highly likely that the actual economic benefit is higher than our estimate, especially when considering the ancillary effects from direct and indirect jobs created by these U.S. exports to China.

Forecasts for U.S. Nuclear Exports to China

Looking to the future, UxC has forecast a high and low range for U.S. nuclear exports to China through the year 2040 in four distinct market sectors as follows:

- **New Reactor Market:** UxC anticipates a potential U.S. nuclear export opportunity to China's new reactor sector of approximately $3-7 billion per year for the entire period through 2040. The near-term outlook through the early 2020s is higher as more AP1000s will likely be built with involvement from key U.S. companies (e.g., Westinghouse, CB&I, etc.). A complete drop off is not expected due to a number of factors, including the fact that U.S. companies will benefit from joint ventures and technology licenses as well as ongoing technological innovation. Thus, an annualized average of around $4.5 billion could be considered a reasonable Base Case export opportunity for U.S. companies in China's new reactor sector.

- **Reactor Operations & Services Market:** The opportunity for U.S. exports in the reactor operations sector is smaller than those for new reactor construction; however, the upside growth potential over time is much larger. UxC anticipates a potential U.S. nuclear export opportunity to China's reactor operations sector of around $300-$500 million for the coming five years or so, followed by a much wider range through 2040. By 2040, the export levels are $1.4 billion in the Low case and $2.7 billion in the High case. A reasonable Base Case export opportunity for U.S. companies in this sector is around $1 billion per year in 2030 and $2 billion per year in 2040.

- **Nuclear Fuel Cycle Market:** The total opportunity for U.S. exports in the nuclear fuel cycle sector is smaller than the reactor sectors since the fuel cycle sector is smaller than the other two sectors, plus China is expected to push heavily for self-sufficiency in its fuel cycle program. Overall, the dollar value range for U.S. exports in the nuclear fuel cycle sector under UxC's two forecast cases goes from $70-$190 million in 2015 to between $400 million and $1 billion in 2040. The growth in both forecast cases reflects the growing fuel cycle requirements in China as the reactor fleet expands along with inflationary and other factors.

- **International Reactor Projects:** In total, UxC forecasts 410 new reactors being built in the world through 2040 in our Base Case. Of these, there is the potential that Chinese companies will become the lead vendors for around 10% of these units (especially in the period after 2025). If China builds 20 reactors overseas, this would certainly result in a substantial amount of money – upwards of $100 billion over a period of about 20 years (~2020-2040). Even if U.S. companies only achieve a 2-3% share of this total, this would still amount to $2-3 billion. Unfortunately, the timing of when these exports would be realized is currently nearly impossible to predict.

Conclusions

China's nuclear industry is far from self-sufficient today, and when reviewing the past experience of other leading nuclear power countries, such as France, Japan, and South Korea, there is clear evidence that even countries with significant domestic capabilities in nuclear power often rely on imports of products and services, including from the U.S., over the long-term.

Figure 1 sums up all of UxC's forecasts through 2040, including exports for new reactor construction, operating reactor services, and fuel cycle supplies. The accompanying Table 3 provides the numerical data for 2015-2025. There is sound evidence to support the conclusion that a minimum level of $3 billion in U.S. exports to China associated with its nuclear energy program can be sustained for the period through 2040. If the High case materializes, this level increases to about $8 billion per year.

Figure 1. UxC Forecast Range for Total U.S. Exports to China's Nuclear Market, 2015-2040

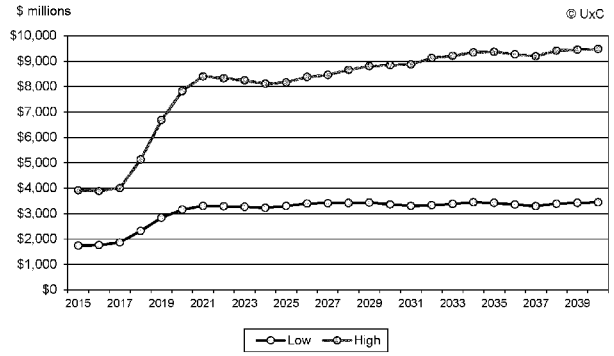

Table 3. UxC Forecast Range for U.S. Total U.S. Exports to China's Nuclear Market, 2015-2025

$ millions	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	202
Low	$1,741	$1,756	$1,861	$2,317	$2,833	$3,156	$3,301	$3,284	$3,264	$3,228	$3,2
High	$3,921	$3,886	$4,001	$5,128	$6,677	$7,823	$8,400	$8,326	$8,243	$8,112	$8,1
Midpoint	*$2,831*	*$2,821*	*$2,931*	*$3,723*	*$4,755*	*$5,490*	*$5,850*	*$5,805*	*$5,754*	*$5,670*	*$5,7*

Based on this future export outlook, UxC's analysis of jobs creation potential from U.S. nuclear trade with China shows that the range is likely to be somewhere between 20,000 and 45,000 jobs per year for most of the forecast period (see Table 4). This is significant, as these will be high-paying jobs in advanced industries across a broad range of disciplines and in many different states around the U.S.

Table 4. UxC Forecast Range for U.S. Jobs Created from China Nuclear Trade, 2015-2025

US jobs	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	202
Low	10,879	10,814	11,290	13,860	16,706	18,351	18,928	18,573	18,215	17,776	17,9
High	24,504	23,927	24,276	30,672	39,370	45,482	48,165	47,091	45,999	44,668	44,3
Midpoint	*17,691*	*17,371*	*17,783*	*22,266*	*28,038*	*31,917*	*33,546*	*32,832*	*32,107*	*31,222*	*31,1*

As this study's aim has been to quantify the direct economic impacts on the U.S. from future nuclear trade with China, the consequences of a complete end to the cooperation agreement can be relatively easily deduced. No more future nuclear trade with China after 2015 would result in:

- A loss of $70 billion (Low Case) to $204 billion (High Case) in total exports through 2040
- A loss of 20,000-45,000 quality U.S. jobs per year for the next 25 years

Attachment 2

CSIS | CENTER FOR STRATEGIC & INTERNATIONAL STUDIES

April 25, 2013

President Barack Obama
The White House
1600 Pennsylvania Avenue, NW
Washington, D.C. 20500

Dear Mr. President:

We write to underscore the importance of preventing nuclear weapons proliferation, and to caution against the adoption of policies that could inadvertently weaken the ability of the United States to continue to provide international leadership on this critically important issue.

For more than half a century, the cornerstone of global efforts to prevent nuclear weapons proliferation has been the "atoms for peace" formula. With very few exceptions, the countries of the world have accepted this formula. Countries that enter into it commit not to pursue nuclear weapons, and in exchange are guaranteed support for their right to develop civil nuclear power and other peaceful uses of atomic energy, and submit to international supervision.

The Atoms for Peace formula has been very successful. Access to commercial nuclear technology was not seen as a threat to the nuclear nonproliferation regime, but rather as a sign of the health of that regime and an essential means for implementing it. One of our nation's most powerful tools for guaranteeing that the countries acquiring this technology continue to use it exclusively for peaceful purposes is to ensure that the U.S. commercial nuclear industry continues to play a leading role in the international civil nuclear marketplace. Here the news is not encouraging.

While the United States and one or two other countries had a near-monopoly on civil nuclear technology in the 1950s, today the list of countries actively competing in the international civil nuclear marketplace includes Russia, France, Canada, Great Britain, Germany, the Netherlands, Japan and South Korea. And it is likely soon that China and India will become active participants in the international nuclear marketplace. According to a November 2010 Government Accountability Office (GAO) report on nuclear commerce, the U.S. share of global exports of "nuclear reactors, major components and equipment, and minor reactor parts" fell from 11 percent to just 7 percent between 1994 and 2008. The U.S. share of global exports of nuclear fuel fell from 29 percent to just 10 percent over that same period of time.

This decline in U.S. market share translates to substantially diminished U.S. influence in such areas as nuclear nonproliferation and nuclear safety. As a result, the United States is in an increasingly weak position to unilaterally impose onerous requirements on potential buyers of civil nuclear technology, simply because buyers have so many alternatives to U.S. sources of supply. It follows that, in order to restore its nonproliferation influence around the globe, the United States Government must find ways to strengthen the competitiveness of the U.S. nuclear industry, and avoid policies that threaten to further weaken it.

We therefore urge that, as part of your export control reform initiative, streamlining of the process for licensing civil nuclear exports be made a top priority. We know that there are experts who

argue that we should make access to American nuclear technology even more restrictive in the future. This would have the unintended effect of further diminishing America's competitiveness in the global nuclear marketplace. America's ability to lead the global nuclear nonproliferation regime will diminish steadily as America abandons the field.

Consistent with the Atoms for Peace policy framework, America restricts the right of other countries to buy from American nuclear suppliers unless those countries agreed to stringent security procedures and conditions (the so-called 123 process). Historically we have managed this process on a sensible case-by-case basis. If we adopt a much more restrictive approach, we will not prevent countries from acquiring nuclear technology, but instead will encourage nations to turn to suppliers that do not impose difficult standards. The non-proliferation regime is weakened in that circumstance.

We share your Administration's concern about the risks associated with the potential spread of sensitive nuclear fuel cycle technologies such as enrichment and reprocessing. But as our nation seeks to reduce these risks, we must be careful not to diminish America's influence in the international civil nuclear marketplace. America's nuclear industry exports are shrinking, and this is bad for non-proliferation policy.

The U.S. Government must recognize that the U.S. civil nuclear industry is one of its most powerful tools for advancing its nuclear nonproliferation agenda. It is critical to adopt policies that will strengthen that tool. Weakening it will merely cede foreign markets to other suppliers less concerned about nonproliferation than the United States.

Sincerely,

Senator William S. Cohen
Former Secretary of Defense

General Brent Scowcroft
Former National Security Adviser

Dr. James Schlesinger
Former Secretary of Energy, Secretary of Defense and Director, CIA

General James Jones
Former National Security Adviser

Admiral Michael Mullen
Former Chairman, Joint Chiefs of Staff

Senator Pete Domenici
Former Chairman Senate Budget Committee

Dr. John Hamre
Former Deputy Secretary of Defense

Ms. Susan Eisenhower
Chairman Emeritus, Eisenhower Institute

Mr. SALMON. Thank you.
Ms. Squassoni.

STATEMENT OF MS. SHARON SQUASSONI, DIRECTOR AND SENIOR FELLOW, PROLIFERATION PREVENTION PROGRAM, CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES

Ms. SQUASSONI. Thank you, and good morning. Thank you Chairmen Salmon and Poe, Ranking Member Keating, and other members of the subcommittees for the opportunity to discuss the U.S.-China Nuclear Cooperation Agreement today. I would like to submit my written statement for the record and just make a few points.

I think all of the panel members that you have heard this morning have said, on the one hand, China has made some important strides, but on the other hand, its record in nonproliferation is a little bit checkered.

And I think I would like to point out that some things have remained really constant over the last 20 years, since we have been involved in nuclear cooperation with China: China's intense drive for indigenizing foreign technology, a porous division between civilian and military nuclear activities, anemic resources for export controls in this hear-no-evil, see-no-evil, speak-no-evil approach to export violations.

So I would like to offer some recommendations, that greater transparency, enhanced dialogue, and benchmarks for progress in Chinese export control would be welcome improvements to this agreement.

So in the agreement itself, what should Congress look for? It is an improvement, but I think you are right to focus on this, what I call the fast track for technology transfer authorizations. And Congress should be careful to assess how well this fast track, which as Henry quite rightly pointed out, sets up approved, preapproved entities, preapproved nuclear technologies, and other things for streamlining, whether this really creates incentives for better Chinese compliance with intellectual property rights.

Second, the advance consent for reprocessing that the agreement provides in Article 6 should be monitored to ensure that if U.S.-origin material is reprocessed, that it is indeed safeguarded. The agreement allows for the option of reprocessing in a facility on China's eligible facilities list, but that doesn't mean the IAEA will actually inspect it. And please note that our agreement with Russia does not allow for this kind of advance consent to reprocessing.

And third, Article 6 contains unique language on managing separated safeguarded plutonium, and this is a mild reminder to China of the risks of plutonium stocks. For the committee's reference, Japan considers reasonable working stocks at a reprocessing plant to be 10 tons or more of separated plutonium. That is a lot of nuclear weapons.

More broadly, Congress needs to consider whether the agreement overall provides adequate nonproliferation assurances regarding the separation of civilian and military nuclear activities, the continued provision of civilian nuclear cooperation by China to Pakistan, and the robustness of China's export control implementation.

So does the agreement provide adequate nonproliferation assurances? China's porous boundaries between civil and military nuclear activities and its intense drive to indigenize foreign technology have resulted in the concerns that you have heard here today about the use of U.S. canned pump technologies in Chinese naval reactors.

Safeguards are designed to help address that porous boundary, and the fast-track procedures for technology and information transfers that place part 810 transfers squarely under the Nuclear Cooperation Agreement are designed to increase accountability within the entities in the Chinese Government.

But Congress could strengthen transparency in a resolution of approval by requiring reporting on steps that the Chinese Government has taken to create firewalls between civilian nuclear and military nuclear sites, facilities, and personnel. Additionally, Congress should require reporting on the new fast track procedures for technology transfer on an annual or biannual basis to assess their effectiveness.

Second, Congress should look for assurances that the U.S. Government is actively working to persuade China to cap its nuclear assistance to Pakistan, or at least recognize reasonable limits so that it stops undermining Nuclear Supplier guidelines policies. You could also require reporting on the steps that the U.S. Government has taken in that regard.

And finally, Congress should seek assurances that China is improving its export controls, at least in the nuclear area. You could require certifications every 5 years that China has taken appropriate and effective steps to improve its export control system and to halt transfers of WMD-related material, equipment, and technology to states of proliferation concern.

You should also require the Director of National Intelligence to provide annual unclassified and classified reports to Congress on WMD-related acquisitions and transfers, specifically from China. This would replace the Section 721 reports that have now stopped.

My written remarks also include recommendations for Congress to strengthen its oversight generally to reflect new realities and support longstanding policies on nuclear cooperation, and I am happy to discuss those in the Q&A. Thank you.

[The prepared statement of Ms. Squassoni follows:]

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Statement before the U.S. House Committee on Foreign Affairs

"NUCLEAR COOPERATION WITH CHINA: STRONG RULES BUILD STRONG PARTNERS"

A Statement by

Sharon Squassoni

Director and Senior Fellow, Proliferation Prevention Program

Center for Strategic and International Studies (CSIS)

July 16, 2015

2172 Rayburn House Office Building Washington, DC 20515

Mr. Chairman, Mr. Ranking Member, Members of the Committee, I thank you for this opportunity to appear before the House Committee on Foreign Affairs Joint Subcommittee to discuss the proposed U.S. agreement for peaceful nuclear cooperation with the People's Republic of China, including China's record on proliferation of weapons of mass-destruction-related materials and technologies.

Nuclear cooperation agreements, like nuclear energy, carry inherent risks. As vehicles for transferring technology, material and equipment that can serve both peaceful and military uses, they must balance competing objectives: to facilitate engagement but limit the proliferation potential of that engagement. Their use in cementing strategic relationships can often come into conflict with their basic purpose of delineating the substance and methods of collaboration. The more important the relationship is in terms of commercial, political and security needs, the greater the pressure is to adjust the balance of obligations towards facilitating engagement. This has been demonstrated many times over, most recently in the case of the agreement with South Korea.[1] This testimony will focus on commercial and nonproliferation considerations, as well as offer some ways to strengthen congressional oversight in this important area.

Background

The United States signs the majority of its peaceful nuclear cooperation agreements (known as 123 agreements after the relevant section in the Atomic Energy Act of 1954, as amended, hereafter AEA) with non-nuclear-weapon states. This is for obvious reasons – thankfully, there are not that many "legitimate" nuclear weapon states and our laws (and good sense) prohibit us from cooperating with states that have not taken on nonproliferation obligations under or akin to the Nuclear Nonproliferation Treaty (NPT). This agreement with China is one of four that the United States has signed with nuclear weapon states: Euratom in 1995 (which includes the UK and France), with India in 2006 (a special case) and with Russia in 2008. One might conclude that agreements with nuclear weapon states do not pose the same risks as those with

[1] The ROK agreement, which was extended for two years because of difficult negotiations, was signed by President Obama in June 16, 2015. South Korea's demands for advance consent for enrichment and reprocessing, which U.S. policy has long rejected for countries that do not currently have enrichment or reprocessing, were repeatedly framed by Korean senior officials in the context of the strategic ROK-US alliance. The compromise included a first-ever High Level Bilateral Commission (HLBC) within the agreement "to facilitate peaceful nuclear and strategic cooperation between the parties and ongoing dialogue regarding areas of mutual interest in civil nuclear energy, including the civil nuclear fuel cycle." Regarding sensitive nuclear technology, the agreement allows (per amendment of the agreement or by "a separate agreement between the Parties" transfer of SNT and technology that is not in the public domain concerning fabrication of nuclear fuel containing plutonium. While it does not grant advance consent for reprocessing, it states that uranium enrichment up to 20% U-235 is permissible if the Parties agree in writing on an arrangement to do so, following HLBC consultations and consistent with the Parties' applicable treaties, national laws, regulations, and license requirements.

non-nuclear weapon states, but U.S. law treats them virtually the same. Only two of the nine criteria contained in Section 123 of the AEA, as amended, differentiate between nuclear-weapon-state and non-nuclear-weapon-state agreements: non-nuclear weapon states are required to have full-scope safeguards (rather than just safeguards on materials and equipment subject to the agreement) and in such agreements, the U.S. has the right of return if the country detonates a nuclear explosive device or abrogates its safeguards agreement. In the case of Euratom, the agreement does contain provisions for termination in the case of abrogation of safeguards or a nuclear weapons test, yet in the case of the agreement with India, neither abrogation of safeguards nor nuclear testing was explicitly cited as grounds for termination. Instead, provisions regarding termination and right of return in the India agreement contained unique clauses designed to dissuade the parties from such actions.[2]

The ostensible reason for treating all agreements similarly is that although small, there is still a risk even in cooperating with nuclear weapon states that materials, technology, and equipment could be diverted to military uses. U.S. export policy acknowledges these risks by requiring specific authorization for Part 810 transfers (nuclear technology) to China, Russia and India. In most cases, countries with 123 agreements qualify for general authorization of transfers, but these are the exceptions. In explaining the proposed rulemaking regarding 10 CFR 810 that became effective in March 2015, the Department of Energy's National Nuclear Security Agency (NNSA) stated that "China and Russia are nuclear weapon states that have not provided the level of transparency regarding the division between their respective civilian and military nuclear programs to warrant general authorization of transfers of technology and assistance for peaceful use."[3] In other words, increased scrutiny is needed.

In the time that the United States has been actively engaged in nuclear trade with China, there have been significant improvements in China's nonproliferation behavior but also persistent opacity in certain areas, and poor enforcement in others, especially export controls. At the same time, China's astounding appetite for energy has merely been whetted by the biggest nuclear new build program in thirty years. While it is tempting to favor commercial considerations above others, particularly since nuclear power construction has been flagging in

[2] Section 129 (a) (1) (A) of the Atomic Energy Act of 1954, as amended, contains the relevant provision under law that would call for termination of nuclear exports if a non-nuclear weapon state detonated a nuclear explosive device or terminated or abrogated IAEA safeguards. In many (if not most) U.S. agreements, this clause is explicitly included in 123 agreements but it was not included in the India agreement for obvious political reasons.

[3] 6450-01-P, Department of Energy, 10 CFR Part 810, RIN 1994-AA02, Assistance to Foreign Atomic Energy Activities, p. 27. Available at: http://nnsa.energy.gov/sites/default/files/nnsa/07-13-inlinefiles/2013-07-31%20SNOPR.pdf

the United States, the current debate over Iran points to the importance of ensuring that peaceful nuclear energy remains just that.

China as a nuclear energy partner

On the commercial side of the ledger, the reasons for continued engagement in nuclear trade with China are compelling. China reportedly will be spending about $11B per year in the next decade on nuclear power plant construction (China has 27 operational reactors, is building 24 reactors and double that number by 2030) at home.[4] What's more, it is one of the few U.S. partners actually buying U.S. commercial nuclear power reactors, which was not true in the case of recent agreements with Russia, India or South Korea. Cutting off existing nuclear cooperation would affect ongoing projects as well as future plans for more Westinghouse-designed AP-1000s to be deployed in China's interior.

If China were merely content to buy U.S. reactors indefinitely, the commercial incentives might in fact be overwhelming for the U.S. nuclear industry. However, in addition to developing its own indigenous reactors based on the first 300 MWe reactor at Qinshan, China has avidly sought foreign technology with the goal of indigenizing it. The first French reactors at Daya Bay had 1% indigenous content (Framatome design based on Combustion Engineering) while those coming on-line ten years later at Lingao had 64% indigenous content (also Framatome).[5] Ten years later (2013), the CPR-1000 reactors at Yangjiang contain 85% domestic Chinese supply.

Westinghouse itself has done much to facilitate technology transfer since its cooperation with China began over a decade ago. On its website, Westinghouse boasts that "Our technology is the basis for nearly 50% of the world's operating commercial nuclear power plants...A leader in technology transfer, Westinghouse has successfully transferred design and manufacturing capabilities to many countries, including France, Japan and Korea." To this list it should add China. Westinghouse's 2006 technology transfer agreement with the Chinese for the AP-1000

[4] China expects to have 88 GWe of nuclear power capacity operating and under construction by 2020. The previous target for 2020 was 70 GWe operational. By 2030, the target was revised downwards from 200 GWe to 150 GWe of capacity. The 2050 target goal is 400 GWe of nuclear power plant capacity, which would constitute about 16% of China's anticipated electricity generation. By comparison, the United States has about 99 GWe of operating reactor capacity at present. See Chinese Academy of Engineering (CAE) report entitled "Energy Development Strategy of China in Mid- and Long-terms (2030, 2050)," published in February 2011.

[5] S. Lau, CGNPC, "CPR1000 Design, Safety Performance and Operability," July 5, 2011 presentation to IAEA Advanced Nuclear Reactor Technology meeting. For Lingao 1 and 2, this can be further broken down: 11% of the nuclear island, 23% of the conventional island supply and 50% of the balance of plant were indigenous content. For Lingao 3 and 4, Dongfang was the equipment supplier, while for Lingao 1 and 2, Framatome and Alstom were still suppliers. CGNPCS's equipment localization for Lingao I was 30%; for Lingao II 60%; for Hongyanhe 70-80%; for Ningde 75-85%; and for Fangchenggang up to 90% for units 5 and 6. See https://www.iaea.org/NuclearPower/Downloads/Technology/meetings/2011-Jul-4-8-ANRTWS/1_CHINA_CPR1000_CGNPC_S.Lau.pdf

is well-known but in 2008 and 2009, Westinghouse also signed agreements with China's State Nuclear Power Technology Corporation (SNPTC) to develop the CAP-1400. This reactor will be China's version of the AP-1000 for deployment at home and for export.

This first-of-a-kind reactor is being built at the HTR-10 Shidaowan site with Shanghai Nuclear Engineering R&D Institute. According to the World Nuclear Association, SNPTC will own the intellectual property rights for reactors above 1350 MWe; a larger variant at 1700 MWe reportedly is also planned.[6] One of 16 so-called "Key National Projects" in China, the CAP-1400 could take the place of the AP-1000s earmarked for inland sites, but could also wind up competing with Westinghouse's AP-1000 in other markets in Asia and beyond.

If there were any doubts about government support for Chinese nuclear exports, the Chinese government announced new financing incentives for industry exports, including for nuclear power and railways in January 2015.[7] China could focus on marketing its own designs, like the Hualong One (ACP-1000, which is a scaled-up version of the Chinese 300MWe reactor at Qinshan), or partner with vendors like Westinghouse or do both. Chinese nuclear firms reportedly are pursuing two Hualong units for a site in Karachi, Pakistan, but China's SNPTC is also reported to be marketing four nuclear power plants (2 AP-1000s and 2 CAP-1400s) with Westinghouse in Turkey. Other rumored deals involve Argentina, Romania, and financial interests in the UK's Hinkley Point C plant (under construction and in trouble) and in Slovakia's nuclear power plants.[8] Moreover, there are signs that China is positioning itself to compete with Russia as a major nuclear vendor, possibly to include offering build-own-operate contracts and take-back of spent nuclear fuel. Either of these two developments could significantly hurt U.S., South Korean, Japanese and French nuclear vendors. In that case, any financial windfall from renewing the nuclear cooperation agreement with China may not materialize as expected.

China as a nonproliferation partner

The unclassified Nuclear Proliferation Assessment Statement, or NPAS, that accompanied the proposed 123 agreement with China, describes a country that has come a long way in improving its nonproliferation credentials, but has further to go. While it stopped short of calling China a nonproliferation partner, it stated that China plays an important role in U.S. efforts to denuclearize the Korean peninsula and in addressing concerns about Iran's nuclear program. The argument for cooperating with China is reminiscent of the one used in favor of

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[6] See http://www.world-nuclear.org/info/Country-Profiles/Countries-A-F/China--Nuclear-Power/

[7] ibid.

[8] "China's CNNC: may bid for Enel's Slovak power firm stake but no decision yet," Reuters, June 28, 2015, available at: http://www.reuters.com/article/2015/06/29/enel-equity-slovakia-cnnc-idUSL4N0ZF03Y20150629

cooperation with India: this agreement is important for incentivizing the recipient state to do better on nonproliferation. Examples of improvement in nonproliferation behavior and policies help support the claim that its behavior is "good enough" to merit cooperation in the first place. For example:

- China, once a purveyor of nuclear weapons plans and material (HEU and designs to Pakistan), became a member of the NPT (1992) with a voluntary safeguards agreement and Additional Protocol (2002), a member of the Nuclear Suppliers Group (NSG, 2004), and a member of other proliferation-relevant treaties (BWC, CWC, CTBT). This evolution occurred over the last 25 years – largely after the first 123 agreement was signed in 1985.
- China has historically taken a skeptical view of export controls as cartel-driven efforts. However, a little over a decade ago, China began putting in place significant export control structures (legislation, processes).

The key issue is China's weak implementation of national export controls, and this may be one of the reasons why members of the Missile Technology Control Regime (MTCR), Australia Group, and Wassenaar Arrangement have been skittish about Chinese membership. China's lax enforcement of domestic export control policies and regulations targeting proliferation – which have been documented for close to 20 years – still results in "concerns about China's nonproliferation record."

- Three areas that could improve Chinese enforcement are a) criminalization of violations (vice imposition of civilian penalties); b) more and better trained personnel to track implementation; and c) more intelligence assets targeted on smuggling. Even in instances (for example, against Zibo Chemet dual-use chemical equipment transfers) where the Chinese government has taken punitive actions, repeated transfers suggest that penalties are insufficient to deter future transfers.
- For many years, the bulk of U.S. sanctions on Chinese entities have been for missile- and chemical-related transfers. In the last five years, Chinese entities have appeared 23 times on the State Department's list of nonproliferation sanctions. A small handful of entities are repeat offenders (like Karl Lee and his front company LIMMT aka Dalian Sunny Industries), earning them the sobriquet of "serial proliferators." In all, ten entities were sanctioned, all in the missile and chemical areas.

At this juncture in time, Congress needs to ask the following questions:

a) Does this new agreement provide adequate nonproliferation assurances?

b) Will this agreement help to improve China's export control behavior?

c) Are there conditions that could improve the robustness of non-proliferation collaboration and reduce proliferation risks?

Does the agreement provide adequate nonproliferation assurances?

The Nuclear Proliferation Assessment Statement has two objectives: to analyze the consistency of the agreement with the requirements of the Atomic Energy Act, and particularly the nine nonproliferation requirements in Section 123 a of the AEA, and to analyze the adequacy of safeguards and other control mechanisms and peaceful use assurances to ensure that any assistance will not be used to further any military or nuclear explosive purpose.

This committee is doubtlessly well aware of why nuclear exports under the 1985 agreement took 13 years to authorize. Significant concerns about China's proliferation record, particularly with respect to nuclear weapons-related transfers to Pakistan, prompted Congress to pass a joint resolution of approval (P.L. 99-183) that conditioned licenses for exports. These related to effective exchanges of information and visits to nuclear sites because the original agreement did not require International Atomic Energy Agency (IAEA) safeguards (because China is a nuclear weapon state under the NPT); certifications to the effect that China was not engaged in sensitive technology exchanges with Pakistan; and that language in the agreement calling for favorable consideration of consent for enrichment or reprocessing did not prejudice U.S. decisions to approve or disapprove of a Chinese request to enrich or reprocess U.S.-origin material.

Compared to the 1985 agreement, the proposed agreement is an improvement in terms of its meeting the requirements of the AEA and China provided assurances prior to 1998 that it halted sensitive technology exchanges with Pakistan. The issues today are somewhat different in terms of nonproliferation assurances.

The first category of nonproliferation assurances is whether or not China's civilian nuclear enterprise is adequately separated from its military nuclear weapons program. As in other nuclear weapon states, Chinese military nuclear weapons programs predated civilian uses of nuclear energy. Historically, China sought to convert military facilities to civilian purposes as a cost-saving measure. China National Nuclear Corporation (CNNC), one of the two major nuclear entities in China, is responsible for the development of both the military and civilian nuclear programs. This duality is evident at sites like the Jiuquan Atomic Energy Complex, where decommissioned military production facilities are co-located with civilian production facilities, and at the Lanzhou uranium enrichment plant. Because China voluntarily places facilities under IAEA safeguards, facilities co-located with military assets are unlikely to be placed on the eligible facilities list. Neither the pilot reprocessing plant at Jiuquan nor the Lanzhou centrifuge plant, built with Russian technology for commercial purposes, is safeguarded because of their co-location with former weapons program facilities. By contrast, the Russian-supplied centrifuge plants at Hanzhong are under IAEA safeguards.

Looking ahead, it may serve U.S. interests for China to reprocess other countries' fuel (e.g., Taiwan's, South Korea's or Japan's) if that limits the spread of reprocessing. Such fuel could have U.S. safeguards obligations attached, given the close ties that the United States has had with those countries. Since the proposed agreement gives the fallback of reprocessing at facilities "that have been made eligible for IAEA safeguards" -- that is, facilities on the Chinese eligible list but potentially not safeguarded, this small loophole could create a political problem. I agree with other experts that China has no incentives to divert reactor-grade plutonium from civil nuclear power plants, but leaving the option open in the future for U.S. acquiescence to unsafeguarded Chinese reprocessing, if on a large enough scale and potentially for foreign customers, is short-sighted.

A bigger concern, as witnesses at other hearings have addressed, is the allegation that U.S. canned pump technology has made its way into Chinese naval reactors. Evidence of such a transfer could be interpreted as violating the terms of the existing 123 agreement, specifically the prohibition (Article 5.3) against using any "material, facilities or components... for any military purpose." The prohibition against any military use (except for very limited circumstances such as producing electricity for the military) is repeated in the proposed 123 agreement, possibly making this an ongoing issue.

At issue is whether assurances are adequate for technology and information transfers. The proposed agreement for the first time addressed technology and information exchanges by establishing an administrative arrangement that builds on the 2003 "Principle-Based Approach to Nuclear Technology Transfer Assurances." This is essentially a "fast track" for transfers related to nuclear reactors and equipment, conversion and nuclear fuel fabrication not containing plutonium. The parties would develop a list of pre-approved activities, technologies, and eligible entities, revising the list as needed. Congress needs to examine carefully whether this expedited procedure does in fact erect stronger firewalls against technology transfer from the civilian to military sectors in China. The hope is that participating entities will enjoy expedited authorizations, and therefore have incentives for stronger internal compliance procedures, and that the Chinese government will have greater incentives for policing behavior because violations could affect implementation of the nuclear cooperation agreement.

The second category of nonproliferation assurances has to do with China's nuclear exports. China's NSG record has been marred by its continued nuclear supply to Pakistan, a country that does not qualify for exports since the NSG adopted the requirement for full-scope safeguards in 1992. Although some contracts were grandfathered when China joined the NSG in 2004 (Karachi nuclear power plant, Chasma 1 &2 and PARR 1 & 2), China is taking a rather expansive

interpretation of these exceptions.[9] As noted in the unclassified NPAS, Chinese plans to supply additional power reactors to Pakistan (Chasma 3 & 4, ACP-1000s at Karachi, or KANUPP 2 & 3 and potentially three others in central Pakistan). Members of the NSG did not assume that endorsing Chinese NSG membership in 2004 meant unlimited nuclear reactors to Pakistan, even if safeguarded. As political recompense for the 2008 India exception to NSG guidelines, this is hardly surprising, but continued disregard for NSG policies will undermine the regime. Given that China agreed with the 2008 exception for India, this unilateral approach will strain NSG policies even more than the 2008 exception for India did.

The third category of nonproliferation assurances is related to China's enforcement of export controls. Ultimately, the more important indicator of Chinese support for nonproliferation is their national implementation of export control guidelines. Effective export controls are the first line of defense, but countries were not obligated to adopt legislation on export controls until the 2004 adoption of UN Security Council Resolution 1540. China's reporting on its compliance with UNSCR 1540 has been spotty (the last report was made in 2007), and its implementation even weaker. One Ministry of Foreign Affairs official estimated in 2013 that, "China lacks resources and expertise to enforce its export controls.[10] This is complicated by the "rapid growth of industries, an unenlightened legislature, separated regulations and ministerial decrees and weak or ambiguous linkage to law."

Will this agreement help improve China's export control behavior?

China joined the Zangger Committee to facilitate implementation of the 1985 agreement and later joined the Nuclear Suppliers Group. Since nuclear cooperation with China began in earnest with the Westinghouse AP-1000 reactor sales, Chinese officials have participated in various DoE, DHS and State Department training programs specifically in export control, as outlined in the unclassified NPAS. This is one way in which a framework cooperation agreement can facilitate better nonproliferation behavior. Ultimately, however, China will have to devote increased resources across the board to improve its capacity to detect, catch, investigate, and penalize export control violators. Increased transparency regarding

[9] Patricia McNerney, Principal Deputy Assistant Secretary, international Security and Nonproliferation, Statement before the U.S.-China Economic and Security Review Commission, "China's Nonproliferation Practices," May 20, 2008, available at: http://2001-2009.state.gov/t/isn/ris/rm/105084.htm

[10] Li Hong, Secretary General of China Arms Control and Disarmament Agency, CSIS Workshop of Strategic Trade Controls in Taipei, August 2013. http://csis.org/files/attachments/130828_LiHong.pdf

government cases may help in deterring future proliferation activity. As of 2012, there were only four to five publicly made cases of government penalization for export control violations.[11]

U.S. concerns about China's export control behavior in the chemical and missile arenas are beyond the purview of this agreement. At most, promulgation of best practices in export controls in the nuclear area could have a spillover effect in other WMD-related areas. In the case of the U.S.-India 123 agreement, the Hyde Act called for termination of exports in the case of materially significant transfers of nuclear material, equipment and technologies by India inconsistent with the Nuclear Suppliers Group guidelines and transfers of ballistic missiles or missile-related equipment or technology inconsistent with MTCR guidelines. An alternative approach here would be for Congress to include a requirement for reporting by the executive branch on efforts to bring China into the MTCR, Australia Group and Wassenaar Arrangement and obstacles to those efforts. Another option would be to require regular reporting by the executive branch on efforts to secure China's participation in the Proliferation Security Initiative as a way of enhancing China's interdiction capabilities.

Are there conditions that could improve the robustness of non-proliferation collaboration and reduce proliferation risks?

As Congress demonstrated in 1985, placing conditions in a resolution of approval can effectively halt exports despite entry into force of a 123 agreement. At this juncture, such an approach would be highly counterproductive, with serious negative commercial and political consequences. On the other hand, Congress may wish to consider actions that could encourage greater transparency from China on the separation of military and civilian nuclear activities, encourage enhanced dialogue with or commitments from China regarding its civil nuclear cooperation with Pakistan, and provide benchmarks for progress in Chinese export control implementation. Specifically, Congress should consider:

a. Requirement for reporting on steps the Chinese government has taken to create firewalls between civilian nuclear and military nuclear sites, facilities and personnel, whether administrative or physical.
b. Requirement for reporting on steps the U.S. government has taken to seek Chinese restraint regarding civil nuclear cooperation with Pakistan, both with China and within the NSG.

[11] Chin-Hao Huang, "Bridging the Gap: Analysis of China's export controls against international standards," Final Project Report to Foreign and Commonwealth Office Counter-Proliferation Programme, April 2012. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/207441/Final_FCO_Huang_Chinese_export_controls_report.pdf

c. Certifications every five years that China has taken appropriate and effective steps to improve its export control system and to halt transfers of WMD-related material, equipment and technology to North Korea and Iran and other states of proliferation concern.
d. As an adjunct to the certifications, a requirement for the Director of National Intelligence to provide annual unclassified (and classified) reports to Congress on WMD-related acquisitions and transfers from China. This would provide a substitute for the Section 721 reports that were discontinued in 2013.
e. Reporting on implementation of technology transfer administrative arrangements on an annual or bi-annual basis from the executive branch to assess their effectiveness.
f. Providing authorization for expanded export control cooperation.

Part of the challenge in collaborating with China in many areas has been the lack of transparency. These steps above would enhance that transparency and provide additional leverage to both the executive branch and the Congress in areas that are of importance and concern without unduly hampering continued civil nuclear cooperation.

Lastly, Congress should consider updating the Atomic Energy Act to strengthen its oversight and reflect new realities and support long-standing policies. Congress could consider the following actions:

1) Require congressional review of ongoing cooperation under 123 agreements with indefinite duration and/or rolling or automatic extensions.
2) Require all new nuclear partners (and in renewal agreements) to have Additional Protocols to their IAEA safeguards agreements in force before a 123 agreement can be approved. Making the Additional Protocol a legally binding requirement could eventually help NSG adoption of that requirement, in much the same way that countries adopted full-scope safeguards as a condition of supply before the NSG did.
3) Require the United States to provide favorable options or incentives to other countries in 123 agreements to adopt interim storage over reprocessing of spent nuclear fuel.
4) Require the executive branch to consult with Congress on the general scope of Nuclear Proliferation Assessment Statements or about individual NPASs before they are written or more substantially, specify additional reporting requirements for NPASs.

Mr. SALMON. Thank you.

My first question would be directed to Mr. Sokolski and Mr. Lipman, and it would actually be regarding some of the thoughts, and maybe others, that Ms. Squassoni has recommended.

Some of the recommendations, that we would have additional review for export licenses and subsequent arrangements involving components and technology that could be used for naval propulsion, stronger Chinese Government control of proliferation by private Chinese entities, or assurances on halting Chinese thefts of U.S. nuclear technology.

So if those conditions were established on the implementation of the U.S.-China 123 Agreement, how would that potentially impact the U.S.-China nuclear commerce? Would it drive them to not deal with the United States as much if we put those kind of additional safeguards in place? Or given what we heard in the first panel, we have the best technology in the world, is that good enough to keep them at the table? And then how would it potentially affect nonproliferation goals and carbon emissions?

So I will start with you.

Mr. SOKOLSKI. Well, never let it be said that you don't ask a lot of questions in one question.

Mr. SALMON. Nobody has ever accused me of that.

Mr. SOKOLSKI. Yes, well, you are a good journalist.

Let me try to keep it simple. I think there is a danger if you start conditioning this agreement on getting the Chinese to agree to anything. I wouldn't do that.

People are concerned about jobs. By the way, I am not sold that there are that many jobs, and we can get into that in a moment.

I think you don't want to upset the Chinese.You know why? Our Government is not doing a great job in managing affairs in East Asia. We don't need additional headaches. That is what I would worry about, not the jobs.

That said, everything I suggested does not require holding up the agreement or getting the Chinese to admit that they have done something wrong.

There are two things. The reprocessing consent rights need to be forced into a situation where if they go down that route and they open up reprocessing—by the way, we should discourage it—then they have to be treated like Russia, and the President is just going to have to certify that that is how he is going to do it. And he needs to announce that now to discourage them from going down that route, because they don't need that to promote nuclear power.

The second thing is, you need to get that U.S. design definition down. They defer to industry, essentially, is the testimony we got May 12, to decide what is and is not of U.S. design. But that is a conflict of interest. Westinghouse, in particular, sells technology as part of the package. We want the government to be in the business of controlling. It has to define what is U.S. designed.

And I think you need to focus on those things, and I would focus certainly on the recommendations in my testimony, which are modest. They are twofold. There are some additional requirements that have you more involved, and that is it. I would not hold the deal up and I would not try to get the Chinese to say certain things.

Let the deal go forward, but curtail the two excesses that are identified in the testimony, the reprocessing, which was unnecessary to give advance consent, and I would really get someone to actually say in writing we are not going to let preapprovals circumvent the existing procedures, because if anything, the Chinese have established they are not to be trusted on this issue.

Mr. SALMON. Mr. Lipman, if we go ahead and implement the things that have just been recommended, which seem reasonable, does it jeopardize any kind of a relationship, or, as he said, if we just say this is the deal, take it or leave it, this is what we are going to do? What are your thoughts?

Mr. LIPMAN. Certainly, any kind of ultimatum-like language that says take it or leave it is not something any reasonable businessperson would concur with.

Second, to Henry's earlier point, if they are using U.S. technology, and they are, then export controls are in place. I mean, that is one of the reasons you transfer technology, is you want other countries to use your technology. Because if they are not using your technology, then you are on the outside looking in, commercially. So as long as U.S. technology is used, U.S. export controls are in effect.

I would urge you to look at, as I think Mr. Countryman did, the Korea program, which this committee has reviewed in the past. That technology has been in play by the Koreans for decades, since the early 1980s. They have improved upon it, they have developed it further, yet it still maintains U.S. export controls.

Relative to some of Sharon's suggestions, I would preface some remarks on them by simply saying, I agree with General Klotz that we have a very robust, thorough, and I will add time-consuming approach to the processing of export control licensing. And certainly anything that lengthens the cycle time is not helpful. In fact, it is a disadvantage for U.S. countries.

However, I think there are some points Sharon made that I would concur with. And I am not going to, I think, catch them all, but in reading her testimony earlier, the creation of firewalls between civilian and nuclear military sites, facilities, personnel, that sounds very reasonable to us.

Requirements for reporting on steps. The United States Government has taken to seek Chinese restraint regarding civil nuclear cooperation with Pakistan, both within China and I think she said the NSG also, that sounds reasonable to us too.

Certifications on the surface sound reasonable, but you have to be careful what you are certifying. I mean, the language is very important there.

Transparency is a good thing. Having the Directorate of National Intelligence providing an annual report, classified and unclassified, sounds like a good thing, but it ought to focus on those things controlled by the 123 and not get too far afield. Let's stick to the knitting and the spindling. So reporting on the administrative implementation of tech transfer on an annual or biannual basis to assess their effectiveness also sounds like something that is reasonable to us.

So I think those are things that are reasonable. I might depart company from Sharon with respect to the reprocessing, in that the

Chinese have indicated that their intent is to reprocess civilian spent fuel in a civilian facility and that that facility will be open to IAEA safeguards and/or what is known as a voluntary arrangement.

Now, Sharon made a point, but you have to make sure they inspect. That is fair enough. But to me, the offer to put a facility under safeguards and to have it voluntarily inspected is, to me, evidence of good faith.

Thank you.

Mr. SALMON. Thank you.

Mr. Keating.

Mr. KEATING. Thank you, Mr. Chairman.

I just want to touch base on the environmental impact and risk issues. What does the adoption of the passive safety measures of the AP1000 mean in terms of environmental impact and risk? Maybe Mr. Lipman or Ms. Squassoni could comment on that.

Mr. LIPMAN. Okay. So I might ask for a clarification on "environment," because having lived in China for 4 years, it has got some of the worst environment. It has got some of the worst air and water quality that I have personally ever experienced. And having asthma as a result of living there for 4 years, it is the gift that keeps on giving.

So I am for anything that is going to improve Chinese air and water, environment, environmental quality. I think it is important.

Like the United States, the Chinese population lives in the east. Coal is in the north and the west. It gets transported. It gets burned over major population centers. The Chinese understand this, and the Chinese are taking steps, and it is going to need more than just nuclear energy to help.

Mr. KEATING. Oh, I know we can't solve their environmental problems. I mean, in terms of this particular agreement, and the AP1000 in particular. And if they move away from that kind of design, if they are not involved in this, what would that mean in terms of environmental impact and risk?

Mr. LIPMAN. So let's talk about the risk. That is very, very critical. Clearly, the adoption of passive safety technology like the AP1000 is an order of magnitude improvement over the current generation of reactors, and that is important. So it mitigates risk.

Nuclear safety is important. We do have concerns that a very rapid expansion of the nuclear energy program has to be done in a way that maintains the highest standards, no short-cutting of any sort whatsoever.

Passive safety technology allows for less operator intervention. It allows for natural phenomena, like condensation, evaporation, and convection to cool the reactor in the case of a major reactor upset like we saw in Fukushima. So we want them to use these technologies with advanced safety concepts.

Other companies in the U.S. are talking to the Chinese about small modular reactors, which represent yet another step forward in terms of nuclear safety improvement.

And all of these would be critical within the confines of the 123. So we want this agreement to go through so that kind of safety cooperation can continue and mitigate risk.

Mr. KEATING. I can associate myself with many of those concerns coming from my own district, where design there is antiquated and we see some of those problems. And we don't have those passive safety measures even here at home.

Would you like to comment, Ms. Squassoni, on that?

Ms. SQUASSONI. Yes, just on that point. I think it is important for the committee to remember that in at least the nuclear safety and nuclear security regimes there are no internationally binding standards. And so I guess in that sense, the role of industry is very important.

I guess I would caveat that by saying while it is true that China is building, they are building EPRs, French technology, American technology, I would also support the U.S. technology as having excellent safety.

Mr. KEATING. I only have 60 seconds left. I just want you to comment on the agreed minute provision in this. Evidently, given some of the testimony, there are some concerns about the effectiveness of that. If you could, just in the little time that remains.

Mr. LIPMAN. Thank you, Congressman.

My view of the agreed minute and placing technology transfer to some degree under the 123 is an important improvement. The concern is somehow that things will get rushed through. I see it as differently. I see it is that if there is a concern or a problem or that the Chinese perpetrate some sort of violation of export controls, it is now a treaty violation. It is not just a violation of an export control rule, it is a treaty violation. And not being an attorney, though, my understanding is that that is much more of a serious problem for the Chinese.

Mr. KEATING. To come full circle with the testimony of Mr. Countryman, when he mentioned politics, I think that shows how maybe some of that can reenter into this afterwards if necessary.

I yield back.

Mr. SALMON. Thank you.

Chairman Poe.

Mr. POE. Thank you all for being here.

Mr. Lipman, your colleagues have made several recommendations to us to put in the 123 Agreement. Do you agree with those recommendations? Without going through all of them, do you agree with them or not agree with them?

Mr. LIPMAN. I agree with some of the recommendations indicated, Sharon's in particular. I generally would like to see this agreement go through without encumbrance.

I do understand, separate from this committee, that in fact there are other concerns in other committees relative to the military diversion issue. We understand those are being addressed.

We do concur with the role of the intelligence community. We think they are already engaged in this process. But others would like to see a stronger role.

We, of course, as patriotic Americans, want to make sure that our technology is only utilized for peaceful purposes, and involvement of the intelligence community and other branches of government that assure that in a process that allows us to go forward commercially is something we would support.

Mr. POE. How much money are we talking about as far as industry goes that the U.S. would be able to benefit if we go and build it and maintain it, as opposed to the French?

Mr. LIPMAN. Okay. So this is a 30-year agreement, and so it is hard to——

Mr. POE. If you can kind of cut to the chase, Mr. Lipman.

Mr. LIPMAN. Yes, sir. So I would say you have got $12 billion in sales under the current agreement. You probably have another $30 billion to $60 billion under current negotiation, and one might say that going forward in a 30-year basis you would have several billion dollars per annum in sales in each of the 30 years of the agreement.

Mr. POE. And as I asked Mr. Countryman when he was here, having a presence in China building it has an advantage over not having a presence and somebody else building it. Would you agree with that or not?

Mr. LIPMAN. Absolutely correct.

Mr. POE. Because when you build it, you monitor it, the safety, the security. Is that correct or not?

Mr. LIPMAN. You not only build it, but you are there for in many aspects for decades to come, because you service the plant, you refuel the plant, you sell renewal parts, you are working with the Chinese in a variety of different industrial cooperative relationships.

Mr. POE. So you don't build it and then you come back to Texas, so to speak.

Mr. LIPMAN. No, sir.

Mr. POE. You stay over there, maintain it, supervise it, like you would any other project that you would build.

Mr. LIPMAN. That is correct. We are not selling Pepsi, Chairman, we are there for the long haul.

Mr. POE. Or Dr. Pepper in Texas.

Mr. LIPMAN. Yes, sir.

Mr. POE. Let me ask you this. We have a 123 Agreement with Russia. It expires in 28 years, I believe. It is a 30-year agreement. Were you involved in that at all?

Mr. LIPMAN. No, sir.

Mr. POE. Were any of you involved in the Russia 123 Agreement?

Mr. SOKOLSKI. Yes.

Mr. POE. You were involved in it. Okay.

Your recommendation is when we design this 123 Agreement with China, we make sure the same rules that we requested and have with Russia are in this agreement. Is that a fair statement?

Mr. SOKOLSKI. Let's not discriminate.

Mr. POE. Treat them the same. Treat the Chinese and the Russians the same?

Mr. SOKOLSKI. At least on the reprocessing, on that issue you treat them the same.

Mr. POE. On reprocessing. Okay, thank you for that recommendation.

Let me ask you another question. If my list is correct—let me say it this way. I think the public is concerned about a lot of things. We are concerned about—when you mention nuclear capability people get nervous. So we have civilian nuclear capability. We have

military nuclear capability. And then we have intercontinental ballistic missile capability to deliver nuclear weapons. Those are kind of the three things I think we are all concerned about.

If my understanding is correct, there are nine countries that have nuclear weapon capability as of today: U.S., Russia, United Kingdom, France, China, India, Israel, Pakistan, and the latest being North Korea in 2006.

Look down the road, if you would. Where do we see nuclear weapon capability going? Who is next? Who is next? Any predictions?

Mr. SOKOLSKI. I just wrote a book.

Mr. POE. I know. I got your book up here. I got your book. So tell me the countries that we should be concerned about.

Mr. SOKOLSKI. I would worry a lot about East Asia.

Mr. POE. Specifically who?

Mr. SOKOLSKI. Japan, South Korea, and it is even conceivable Taiwan.

Mr. POE. How about Saudi Arabia, Egypt, Turkey?

Mr. SOKOLSKI. Well, you asked which ones are the quickest. In time, yes, you get a benefit of possible competition in the Middle East, and all of the ones that you have heard, all of the ones that you have said, get thrown in as well.

The reason you have to worry about the Far East, however, is because the line between civil and military is much more blurred there than any other place in the world, with a possible exception of India.

And the Japanese have been playing a game of plutonium poker for many decades. They pile up plutonium. They don't burn it. That gets our attention. It gives you a nuclear guarantee. It gets the attention of China and South Korea, who are very upset about it.

There is no agreement about reprocessing in China. Now, there is clear proof. It is not in the 5-year plan yet. I spoke with the chairman, the former chairman of the Chinese National Nuclear Corporation, which makes the nuclear weapons and is interested in promoting the reprocessing. He said: We do worry about safety. That is the reason we need to have your cooperation, because we are going primarily with the American design.

The French, by the way, I don't think you need to worry about the French. They are in receivership, sir. They are not competitive. They may not even make another reactor at the rate they are going given the troubles they have.

Korea and Japan, let's just say they will follow our lead.

I think you need to be a little more upbeat about what is possible and understand that the Chinese also see this deal as something that might benefit them. And we need to be aware of that. Don't hold it up, but focus on the reprocessing, because it is contingent. You do not want those Asian countries piling up plutonium. And I would pay attention to the export control stuff.

Mr. POE. I yield back.

Mr. SALMON. Thank you.

Mr. Sherman.

Mr. SHERMAN. Thank you. Mr. Chairman, thank you for holding these hearings. The White House decided to convene a meeting that conflicted with these on the Iran nuclear deal. This nuclear

deal may not be getting the same level of publicity, but also poses interesting policy questions.

Mr. Lipman, we are going to be restricting China from re-exporting U.S. technology. The issue is, what is U.S. technology? One can imagine a gallon of paint that is American with one drop of Chinese technology in it. One can imagine a gallon of Chinese technology with one drop of American technology in it. What is the definition of U.S. technology subject to export control?

Mr. LIPMAN. Thank you, Mr. Sherman, Ranking Member Sherman. I don't think there is something formulaic, but I will give you a business guy's response to it.

Technology is generally comprised in technology transfer agreements, commercial technology transfer agreements, as foreground technology and background technology and joint technology. And there are definitions, business definitions in these agreements.

If the Chinese have taken AP1000 technology and modified it, the so-called CAP1400, as some have indicated, that is still U.S. technology. Why is that U.S. technology? Because under definitions of the tech transfer agreements between the two companies—and I was then a Westinghouse executive involved in that—that clearly has a basis in U.S. technology.

Over time, as designs evolve and change, and change fairly radically, they can change fairly radically, that becomes far more tenuous. But certainly, as we look forward over the next decade or more and we look at the evolution of Chinese designs, which we can, and which we do, because we are involved in them, they are clearly based, at least the advanced passive technology, are clearly based on U.S. technology in our view.

Mr. SHERMAN. Japan has constructed a large reprocessing facility which it wants to take online in the next few years. I think Mr. Sokolski has commented on that. South Korea has been interested in reprocessing and demanded that the United States agree to a process enshrined in the new 123 Agreement that we have with South Korea, currently pending before Congress, whereby in about 6 or 7 years we would have to decide whether to give them consent. We would have to say yes or no.

China's agreement with the U.S., which is the one we are having these hearings on, provides, it appears to be, an advance consent to reprocess subject only to the facility being made available for safeguarding.

We just had hearings yesterday. Apparently China, Japan, and South Korea are not always real happy with each other and may not be sanguine as one or the other moves toward reprocessing, may be anxious to stop reprocessing in one of the others.

Mr. Sokolski, should we be concerned that we would have many tons of separated plutonium available for weapons in each country that may be reprocessing, as all three may be reprocessing in the future? And perhaps would these countries be interested in a mutual moratorium on reprocessing, or are they more interested in reprocessing themselves or causing one of their neighbors, perhaps, to not reprocess for a while?

Mr. SOKOLSKI. I took a trip, actually two trips, to try to promote, and for what it is worth, I talked with the government, our Govern-

ment, before I went. I did not go commando. There is material I want to place in the record.

One of the pieces is that proposal that we floated. And it was, we should back off going ahead with the program President Obama is uncomfortable with, and that is the Savannah River Project, which is a plutonium fuel project. Japan should not open up Rokkasho in March of next year because it doesn't have any way to fabricate the fuel and they have already indicated they want to pile up another 3 tons of material, minimum.

By the way, when you say ton, it is 1,000 kilograms. Divide by roughly 4 or 5 and you get the number of bombs worth. It is a lot of material.

The Koreans were apoplectic when they heard about this. The Chinese have gone public in their opposition. One of the people I talked with in China who is very highly placed said: We may not come to the Nuclear Security Summit; if you don't put a collar on this, we don't work on this.

Each of them made very clear that their plans to go ahead were not fixed, and even the Japanese that I spoke with would like to figure out some way to get an off-ramp to what they have done. They have local constituents just like we do and they are pressing for jobs. But if there was an international effort to take a time out, you could speak to them and say: Well, there are higher priorities.

I think this is the moment. It is one of the reasons I am very anxious that you say something about reprocessing in this deal, because if China gets green lighted it will encourage Japan to just go ahead. If Japan goes ahead, then the Chinese will say: Well, we need to hedge our bets. You do not need to do this for commercial nuclear power. It is not economic. You lose money. It is a dangerous weapons-related activity for the most part.

Mr. SHERMAN. Thank you. I would comment that we may want to have a Pacific nations conference on reprocessing to discuss all three countries' and perhaps our own reprocessing, and maybe countries would see mutual security in that.

I would ask unanimous consent to put in the record a letter from the IBEW, my own opening statement, an article from Foreign Affairs, and other scholarly articles.

Mr. SALMON. Without objection.

Mr. Boyle.

Mr. BOYLE. Yes, thank you.

And I wanted to follow up on a question that I had asked the last panel, and they mostly answered it, but when I specifically asked about the economic impact and jobs they deferred to the second panel.

And Mr. Lipman, in reading all your testimony, including the very helpful appendix, which is entitled "Economic Impacts of U.S. Nuclear Exports to China," I think perhaps you would be the best person to direct this question toward.

Mr. LIPMAN. Thank you, Mr. Boyle.

The job creation from nuclear exports to China under the current agreement have been very, very significant. About 12,000 to 15,000 direct jobs and an equal number of what they call induced or direct jobs were also part of this.

But as you go forward in the implementation of the agreement under consideration, the renewal, the estimates, as you will have seen in the report, indicate, I think, between about 30,000 to 35,000 direct jobs created and sustained—and sustained—over a 30-year period.

It is very, very significant job creation. And it is job creation of high technology, high-skill type of work, which is, I think, very, very important.

And I know the comment was made earlier: Well, you know, maybe we don't worry about the jobs. But the very submittal that Ranking Member Sherman just talked about, he talked about the IBEW letter, well, you all know the position of trade unions on trade agreements. You just went through something here in the last month. So it is very significant that all of the major unions, the IBEW, the United Association, and the Boilermakers, have all come out in support of this renewal.

Now, why would that be? Well, because there are jobs created. There are jobs created for pathway into the middle class. These are jobs that pay a family wage.

And so we are very, very concerned. We do worry about the jobs, the jobs creation here. Thank you, Mr. Boyle.

Mr. BOYLE. Well, and I would say, just not to repeat everything you have just said, but clearly we are not talking about minimum wage jobs. We are talking about well-paying jobs.

And certainly, toward the point that Mr. Sokolski interjected earlier, that is certainly not the only consideration. We are, after all, in a Foreign Affairs Committee setting. It is by far not the only consideration. But it is still a legitimate and valid consideration and one that I think in each one of our 435 districts we have been approached and talked about the importance of jobs and family-sustaining jobs. Well, here we have a wonderful opportunity.

I don't know if, in the interest of fairness, if you wanted to comment since you had questioned the extent to which you think—not to put words in your mouth, but I got the impression that you thought that maybe the number of jobs is being overstated. Is that——

Mr. SOKOLSKI. You know, I don't want to wade into other people's turf. I think you should be skeptical, however, over the long haul as to what the Chinese are up to. They like making their own stuff.

If you take a look at the complaints they have had about the canned coolant pumps, which were defective, some of the valves, they want to make them there themselves. One of the reasons I think they raided our various servers was to get the information.

Now, that said, information isn't enough. They are going to need our advice. You don't really need a 123 Agreement to get that advice, by the way. There are other ways you can do things.

I don't think that should be what is driving how you think about this. If there are jobs, fine. If there aren't, fine.

The bigger questions are the security questions. After all, nothing that has been said at this panel stops this deal. It doesn't even stop reprocessing. But there is a certain laxness, or lax—what do you call it?—looseness with regard—and enthusiasm for doing cer-

tain things in the deal that I would condition and I wouldn't ask the Chinese for permission.

It isn't take it or leave it. It is just good governance. So I don't think you have to choose between the deal and no deal, or reprocessing and no reprocessing, no.

Mr. BOYLE. All right. Well, I thank the panel for their participation. Again, I want to thank the chairmen and ranking members for inviting me here today.

Mr. SALMON. I thank the panelists for their testimony and their answering of questions. We really appreciate it.

And without further objection, this committee will be adjourned.

[Whereupon, at 11:04 a.m., the subcommittees were adjourned.]

APPENDIX

Material Submitted for the Record

JOINT SUBCOMMITTEE HEARING NOTICE
COMMITTEE ON FOREIGN AFFAIRS
U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, DC 20515-6128

Subcommittee on Asia and the Pacific
Matt Salmon (R-AZ), Chairman

Subcommittee on Terrorism, Nonproliferation, and Trade
Ted Poe (R-TX), Chairman

July 16, 2015

TO: MEMBERS OF THE COMMITTEE ON FOREIGN AFFAIRS

You are respectfully requested to attend an OPEN joint hearing of the Committee on Foreign Affairs, to be held by the Subcommittee on Asia and the Pacific and the Subcommittee on Terrorism, Nonproliferation, and Trade in Room 2172 of the Rayburn House Office Building (and available live on the Committee website at http://www.ForeignAffairs.house.gov):

DATE: Thursday, July 16, 2015

TIME: 9:00 a.m.

SUBJECT: Reviewing the U.S.-China Civil Nuclear Cooperation Agreement

WITNESSES:

Panel I
The Honorable Thomas M. Countryman
Assistant Secretary
Bureau of International Security and Nonproliferation
U.S. Department of State

Lieutenant General Frank G. Klotz, USAF, Retired
Under Secretary for Nuclear Security
Administrator, National Nuclear Security Administration
U.S. Department of Energy

Panel II
Mr. Henry D. Sokolski
Executive Director
The Nonproliferation Policy Education Center

Mr. Daniel Lipman
Vice-President
Supplier and International Programs
Nuclear Energy Institute

Ms. Sharon Squassoni
Director and Senior Fellow
Proliferation Prevention Program
Center for Strategic and International Studies

By Direction of the Chairman

The Committee on Foreign Affairs seeks to make its facilities accessible to persons with disabilities. If you are in need of special accommodations, please call 202/225-5021 at least four business days in advance of the event, whenever practicable. Questions with regard to special accommodations in general (including availability of Committee materials in alternative formats and assistive listening devices) may be directed to the Committee.

COMMITTEE ON FOREIGN AFFAIRS

MINUTES OF SUBCOMMITTEE ON *Asia and the Pacific, and Terrorism, Nonproliferation and Trade* HEARING

Day *Thursday* **Date** *7/16/15* **Room** *2172*

Starting Time *9:00am* **Ending Time** *11:04am*

Recesses [ ] (____to____) (____to____) (____to____) (____to____) (____to____) (____to____)

Presiding Member(s)

Matt Salmon

Check all of the following that apply:

Open Session [✓]
Executive (closed) Session [ ]
Televised [ ]

Electronically Recorded (taped) [ ]
Stenographic Record [ ]

TITLE OF HEARING:

Reviewing the U.S.-China Civil Nuclear Cooperation Agreement

SUBCOMMITTEE MEMBERS PRESENT:

Ted Poe, Dana Rohrabacher, Joe Wilson, Mo Brooks, Scott Perry, Steve Chabot, Bill Keating, Gerry Connolly, Tulsi Gabbard, Robin Kelly

NON-SUBCOMMITTEE MEMBERS PRESENT: *(Mark with an * if they are not members of full committee.)*

Brendan Boyle

HEARING WITNESSES: Same as meeting notice attached? Yes [✓] **No** [ ]
(If "no", please list below and include title, agency, department, or organization.)

STATEMENTS FOR THE RECORD: *(List any statements submitted for the record.)*

TIME SCHEDULED TO RECONVENE _____
or
TIME ADJOURNED *11:04*

Subcommittee Staff Director

[NOTE: Material was submitted for the hearing record by the Honorable Brad Sherman, a Representative in Congress from the State of California, ranking member of the Subcommittee on Asia and the Pacific, and Mr. Henry D. Sokolski, executive director, The Nonproliferation Policy Education Center. Those materials are not reprinted here but may be accessed from the hearing page on the Internet at: http://docs.house.gov/Committee/Calendar/ByEvent.aspx?EventID=103718.]

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